# Reference Guide

**Xtreme**
METAL DETECTOR

ERIEZ

# HANDLING INSTRUCTIONS

DO NOT LIFT THE METAL DETECTOR BY INSERTING ANYTHING INTO OR THROUGH THE TUNNEL. The inner surface of the tunnel protects the precisely tuned electronic circuit and internal parts. The tunnel liner also protects the internal parts against water damage. The integrity of this liner and seal must be maintained. Any damage or distortion to this surface caused by handling will invalidate the warranty.

When handling, keep the metal detector on the shipping pallet as long as possible. When removing the detector from the shipping pallet LIFT ONLY ON THE DETECTOR HOUSING SURFACES OR SUPPORTING FEET. DO NOT LIFT BY THE CONTROL HOUSING THAT PROTRUDES FROM THE BODY OF THE METAL DETECTOR.

If possible lift the metal detector by using a crane and soft nylon slings running under the entire metal detector housing as seen below.
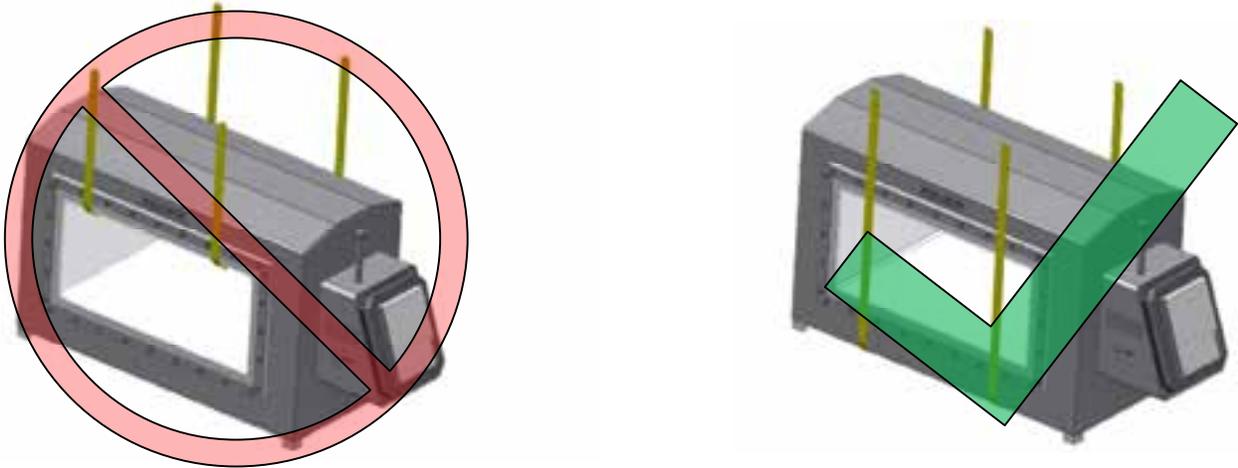


Larger metal detectors may have eyebolts preinstalled at the factory. When handling with the eyebolts ensure loads are never applied perpendicular to the shank of the eyebolts; they will break.

The metal detector is heavy. Use care when handling to avoid injury to personnel or damage to property.

Eriez DOES NOT recommend the metal detector be lifted by hand or supported by personnel.

Never weld any attachment to the metal detector. Do not attempt to drill and/or tap the metal detector for lifting or mounting attachments.

# SPECIFICATIONS

**SUPPLY, MAINS, VOLTAGE**

The Xtreme Metal Detector will operate from AC supply voltages over the range of 100 to 240 VAC RMS, 50 or 60 Hz.

Mains supply voltage fluctuations shall not exceed ±10% of the nominal value.

**EQUIPMENT CLASSIFICATION**

The Xtreme Metal Detector is specified for the following categories:

- Class 1 equipment requiring a protective ground conductor.
- Installation Category (Overvoltage Classification) II
- Pollution Degree 2

**MAXIMUM DEMAND**

The internal electronics require 60 VA to operate.  The power available for external loads (powered from the internal source) is 1250 VA and is limited to 5 amps of current by CB1.  Maximum demand will be 1310 VA.

**OUTPUTS**

There are nine total outputs, each with one set of contacts.

There are four programmable "Form C" (NO-C-NC) relay outputs rated at 5A (due to PCB trace width) up to 250 VAC, 30 VDC each.

- Reject (K1)
- Relay 1 (K3)
- Relay 2 (K2)
- Relay 3 (K4)

All four relays are fail-safe wired; if power is lost, the relays will switch to the activated position.

NOTE:  If the power at L1B and L2B is used to power the relays, its maximum available current is 5A, and the voltage will be equal to that applied at L1 and L2 on TB3.  Power at L1B and L2B passes through the circuit breaker switch located on the left side of the control housing.

There are five programmable "Form A" (SPST-NO) solid state relay outputs rated at 500mA up to 40 VDC.

- Out 1 (K9)
- Out 2 (K8)
- Out 3 (K7)
- Out 4 (K6)
- Out 5 (K5)

These five outputs can be wired as NPN or PNP.  The output can be set to NO or NC under normal running conditions.

**REJECT**

Reject (K1) is the primary reject device output.  It must run via Reject Timer 1 or Overhead A-B when used.   All reject log information is based on Reject Timer 1.

**RELAY 1-3**

Relay 1(K3), Relay 2 (K2), and Relay 3 (K4) are fully programmable and may use any of the eight reject timers.  They also may use Overhead A-B or be used as a fault or warning output.

**OUT 1-5**

Out 1 (K9), Out 2 (K8), Out 3 (K7), Out 4 (K6), and Out 5 (K5) are fully programmable and may use any of the eight reject timers.  They also may use Overhead A-B or be used as a fault or warning output.

**TIMERS**

There are eight independent reject timers.  Each reject timer has its own travel (delay) time and reject (duration) time in the range of 0 to 60 seconds or 0 to 1200 tachometer pulses.  Each timer has its own fixed on/off time ideal for the use of pusher arms.  Each reject timer runs off of time or tach for both travel and duration time.  Each reject timer can run with or without an index device, and can be set to manual or automatic reset. Only Reject Timer 1 can use reject confirmation.

**FAULT**

All outputs except Reject (K1) can be configured as a fault output.

**WARNING**

All outputs except Reject (K1) can be configured as a warning output.

## OVERHEAD A-B

Overhead A-B runs via Reject Timer 1 and is used for an overhead pusher arm. It can be setup to reject on one or both sides of the conveyor. It can also be setup to always return to the same side of the conveyor when actuated. The functionality of Overhead A-B is based on the hardware used. Additional information on how to setup Overhead A-B is located in the wiring section of this manual.

## INPUTS

The Xtreme Metal Detector has eight configurable inputs that can be set to "Active High" or "Active Low".

Input Voltage

- "High" = 10 to 30 VDC
- "Low" = 0 to 0.9 VDC

Input Impedance = 2.8kΩ

Current Requirement = 3 to 10 mA

## TACHOMETER INPUT

Input Voltage

- Logic "0" = 0.0 to 0.9 VDC
- Logic "1" = 10 to 30 VDC

Input Impedance = 2.8kΩ

Current Requirement = 3 to 10 mA

Frequency: 50Hz (determined by number of poles on Tachometer and maximum belt speed)

Minimum pulse width = 0.005 seconds (5 mSec)

## OPERATING AMBIENT TEMPERATURE RANGE

Integral Control      -10° C (14° F) to 49° C (120° F)
Remote Control      -10° C (14° F) to 54° C (130° F)

## STORAGE TEMPERATURE

-10° C (14° F) to 80° C (175° F)

**RELATIVE HUMIDITY**

0 TO 95%

**MAXIMUM OPERATING ALTITUDE**

2000 meters (6561 feet)

**PRODUCT VELOCITY**

2 ft/min (0.6 m/min) to 3000 ft/min (914 m/min)

**ENCLOSURE**

The standard enclosure is rated NEMA 4X and will withstand the high pressure wash-down standard of $80^0$ C ($176^0$ F) water at 100 bar (1450 psi).

# MECHANICAL INSTALLATION

**CAUTION!**

Xtreme Metal Detectors are manufactured to very stringent quality standards to ensure that they will provide years of trouble free service. To achieve this trouble free service the installer must follow the installation procedures outlined in this manual. The details of these procedures are important and must be followed precisely for proper metal detector operation.

Metal detectors are extremely sensitive to very small changes in the electrical and physical environment. Unstable operation is possible if installed incorrectly. Metal detectors are sensitive to excessive vibration and may generate a false reject signal when the conveyor starts and stops. These problems can be prevented with proper installation techniques.

Please read all instructions prior to using the metal detector. Problems caused by improper installation techniques are not covered under warranty. Time invested in proper installation will be worthwhile and provide trouble free startup and continued reliable service.

**INTRODUCTION**

The metal detector contains several components which must be physically mounted to a conveyor or suitable stand. These include the sensing head, the control (if remote), and other devices such as a tachometer. Most Xtreme Metal Detectors sensing heads have an integral control thus simplifying installation and wiring.

**Figure 1**

The sensing head contains the coils and main electronics.  The head must be installed so the products being inspected can pass through the aperture in a consistent and controllable manner.  It is vital that the sensing head be protected from excessive vibration, physical abuse, electromagnetic interference, static electricity, and corrosive materials.  The conveyor belt, chute, or other conveyance device must not contact the metal detector aperture.

Utilizing the control remotely requires that it be mounted to a convenient surface with minimal vibration.  It should also be easily accessible in the event an adjustment is necessary.  The control enclosure is fitted with mounting tabs that must be isolated to prevent electrical current loops.

## HANDLING

The metal detector must be handled with care during installation.  Refer to the Handling Instructions for more information.

## LOCATION OF SENSING HEAD

The location of the metal detector sensing head is extremely important.  When selecting a location, consider the surrounding processing equipment, product velocity, and rejection of foreign objects.  Operator convenience should also be evaluated.  Ensure installation guidelines are followed and met before the final location is selected.  If there are any questions please contact Eriez for assistance.

## METAL FREE AREA

The metal detector monitors an electromagnetic field to detect metal.  This field is predominantly contained within the aperture of the detector.  However, some of the electromagnetic field extends out from the inlet and outlet of the aperture.  This extended field causes the metal detector to be affected by metal in the vicinity of the aperture.  Metal that is not part of the product stream must not be present in this area. The required metal free area depends on the size of the smaller dimension of the aperture.  In most circumstances 1.5 times the smaller aperture dimension is a sufficient distance for stationary metal and 2.0 times for moving metal.  Testing to determine the metal free distance will help ensure mitigation of false tripping.  Refer to Figure 2.

**Figure 2**

1.5 H

1.5 H

1.5 H

1.5 H

1.5 H

**METAL FREE AREA**

H = smaller tunnel dimension
(typically height)
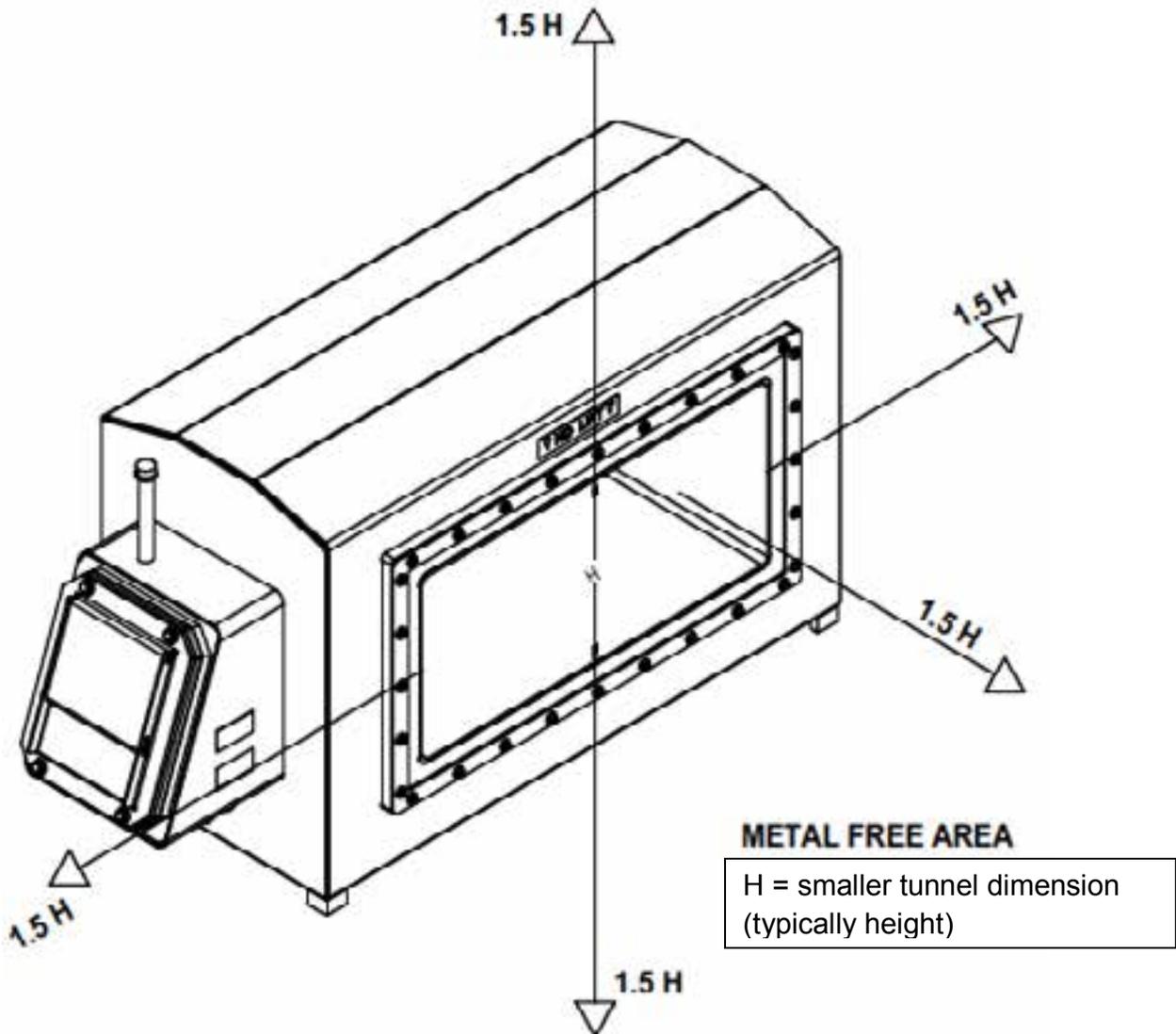
## ELECTRICAL CURRENT LOOP

The most frequent problem encountered in metal detector installations is false tripping caused by intermittent electrical current loops.  The electromagnetic field dissipates in strength with distance to a point that metal outside the "metal free" area will not cause false detections.  Since the field is time varying, it will generate small electrical currents in conductive paths (metalwork) beyond the metal free area.  These currents along with ground currents from nearby equipment will not cause false tripping as long as they are constant.  If the current is disrupted, the resulting disturbance in the electromagnetic field may cause the metal detector to false trip.

The schematic diagram shown in Figure 3 provides a simplified view of a typical metal detector and conveyor. The arrows represent electrical currents. The bearings supporting the pulleys and idlers turn causing them to become "make and break" contact points. Likewise, the cross-members of the conveyor framework represent possible break points. Over time, these connections can work loose or corrode and cause "make and break" connections due to vibration. The interruption or change of the current is a source of electromagnetic interference detectable by the metal detector.

**Figure 3**
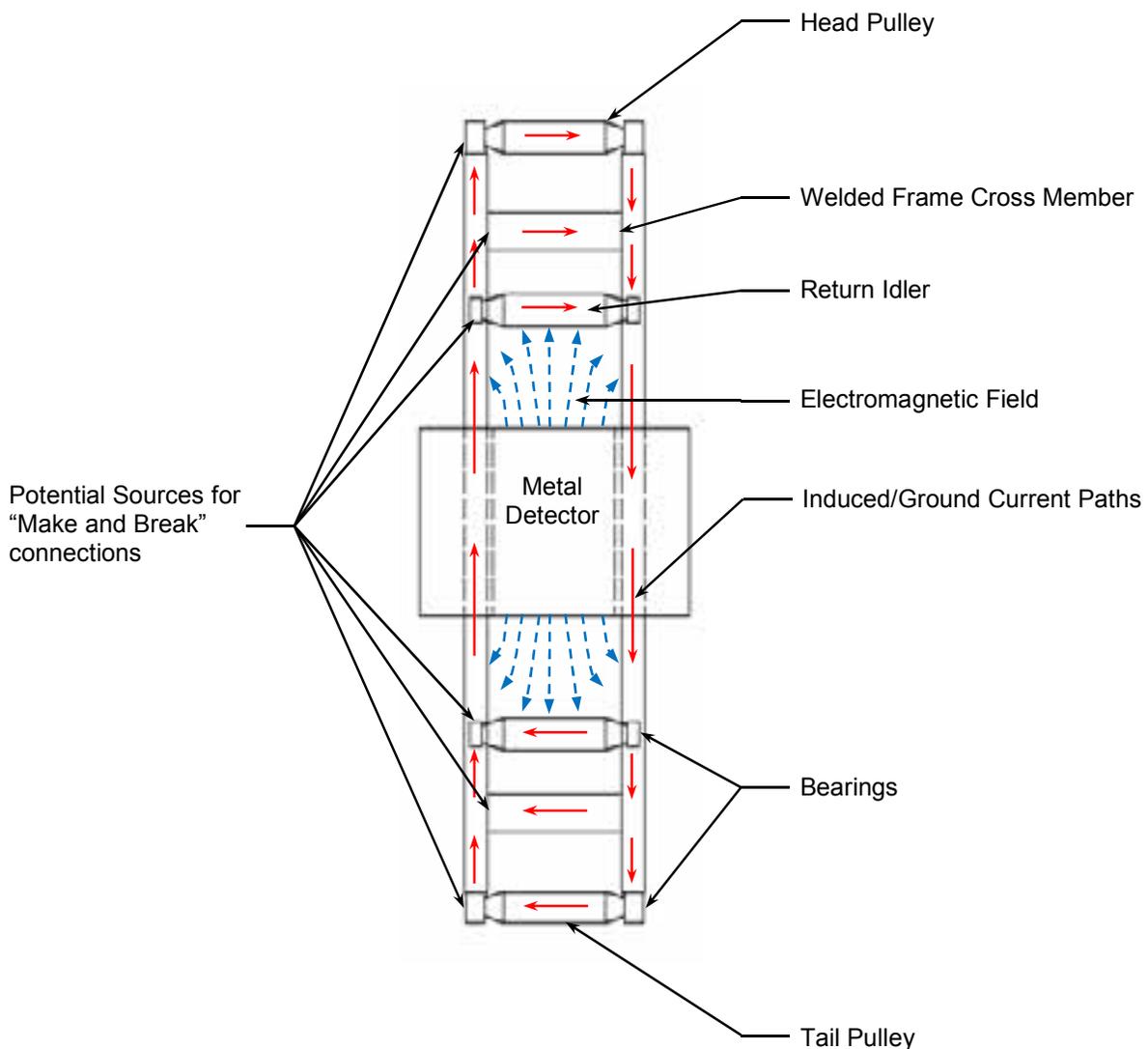
## INSULATING CONVEYOR SHAFTS

A continuous electrical path through pulleys and idlers cannot be assured.  As a result, current changes cannot be prevented in these components.  They must be electrically isolated from the rest of the system by introducing an isolating medium into the conductive path.  There are three common methods to accomplish this task.

The method shown in Figure 4 requires machining the end of the shaft to a smaller diameter to allow space for a nylon plastic sleeve.  The outside diameter of the sleeve is the same as the inside diameter of the bearing.  This sleeve breaks the electrical connection between the bearing and the shaft, thus permanently preventing current flow.  WARNING: Do not cut through the sleeve when tightening the bearing set screw.

**Figure 4**

Pulley or Idler

Nylon Insulator
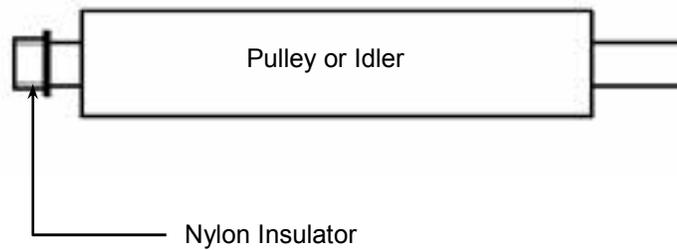
Figure 5 shows a method of insulating the complete bearing block from the conveyor frame.  This requires drilling the bolt holes through the bearing block to a diameter large enough to accept an insulating shoulder washer.  The bearing block should also be insulated from the conveyor frame with non-metallic insulators extending across the base of the block.

**Figure 5**

Insulating Shoulder Washer (Nylon)

Insulating Shoulder Washer

Insulator Material
(Neoprene or Fiberglass)

MECHANICAL
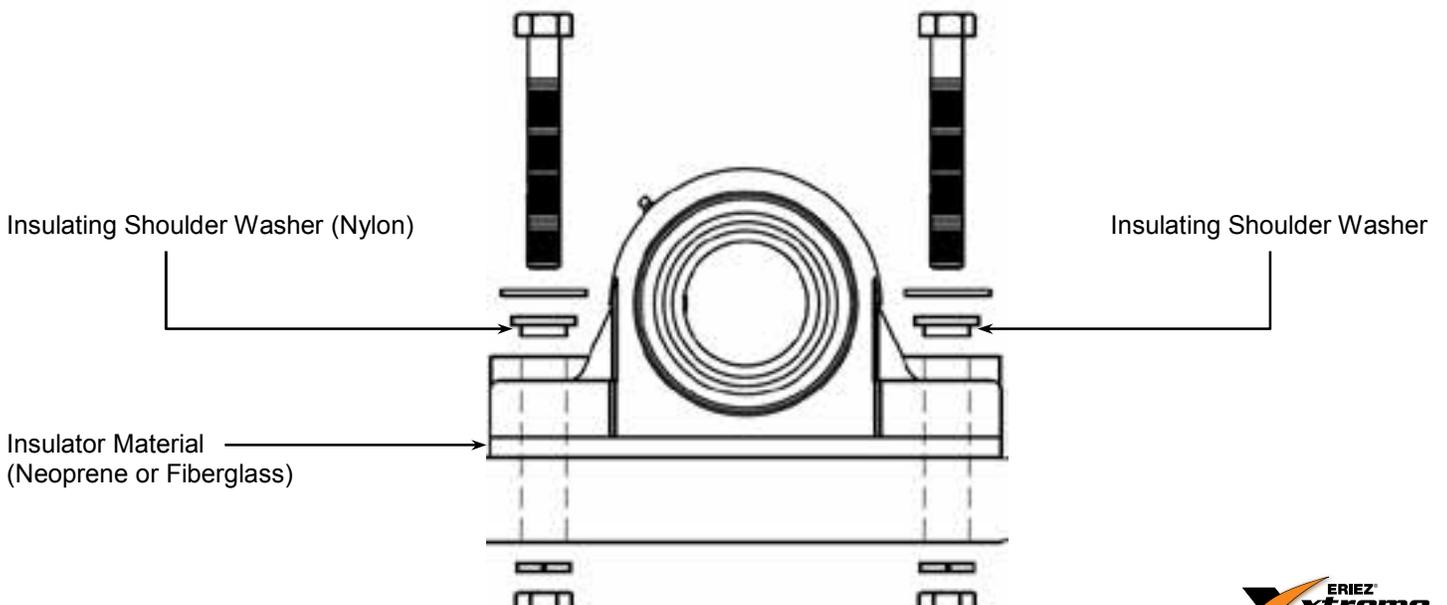
Figure 6 shows the method recommended by Eriez and is also the simplest method. It requires the bearing block on the end opposite the motor to be replaced with a plastic/non-metallic one.

**Figure 6**

Non-metallic/Plastic Bearing Block
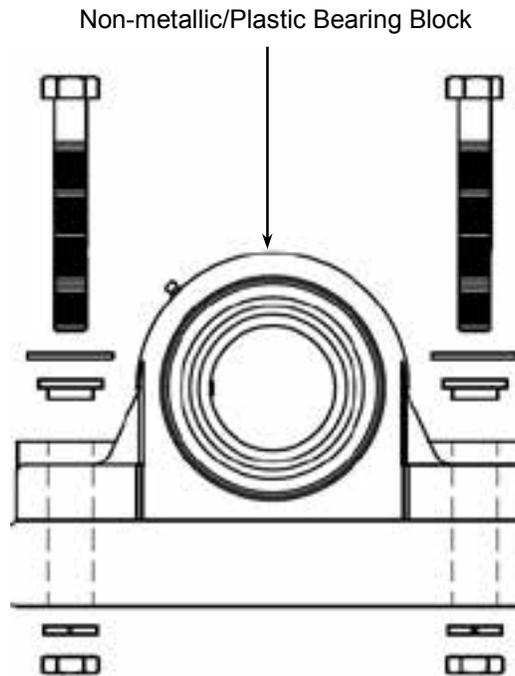
All three insulating methods are reliable. However, it only takes a small metal shaving or burr to cut through and short-circuit the insulators. A check of the integrity of the insulation with an ohmmeter will ensure everything is correctly installed. Insulating either end of the shaft will prevent current loops but will also prevent testing with an ohmmeter. For this reason, isolating both ends during testing is recommended.

Build-up of a static electric charge on the conveyor belt can also cause false tripping. A static charge can build up on pulleys or idlers that are insulated on both ends. To prevent this build-up and subsequent false tripping, the insulation must be modified to ensure a ground. After the integrity of the insulators is checked with an ohmmeter, one end of each shaft should be electrically reconnected to the conveyor frame. If the sleeve insulating method has been used, the setscrew of one of the bearings should be extended to make contact with the shaft. This may require drilling a small hole through the sleeve and inserting a sharp pointed setscrew. If the bearing block insulating technique has been used, simply remove one of the shoulder washes on one end of the shaft. If using the plastic bearing block method the opposite bearing block is metallic and grounded already. The integrity of the insulators can easily be rechecked when using any of the three methods.

NOTE:

If a drive pulley is powered by a metal chain, it is not necessary to remove the insulators on either end of the shaft as described above. The metal drive chain will bleed off any static charge that may accumulate on the pulley.

If a non-metallic drive belt is used, insulate the conveyor pulley on the side opposite the drive motor.

**PERMANENT CURRENT LOOPS**

Permanent conduction paths (i.e. cross members) in the conveyor frame should be welded securely to provide a reliable path for any current that may be created. Bolted construction may eventually degrade and is not recommended unless designed and executed by experts in metal detector conveyor construction. Any conduction path that is to remain removable or that cannot be welded or permanently bolted must be electrically isolated from the conveyor frame.

Figure 7 shows a conveyor frame properly modified for a metal detector installation. Notice that possible breaks in the current paths no longer exist and the only current loops in the conveyor frame are running through a permanently welded connection. These current loops will be constant and therefore will not cause false detections.

**Figure 7**

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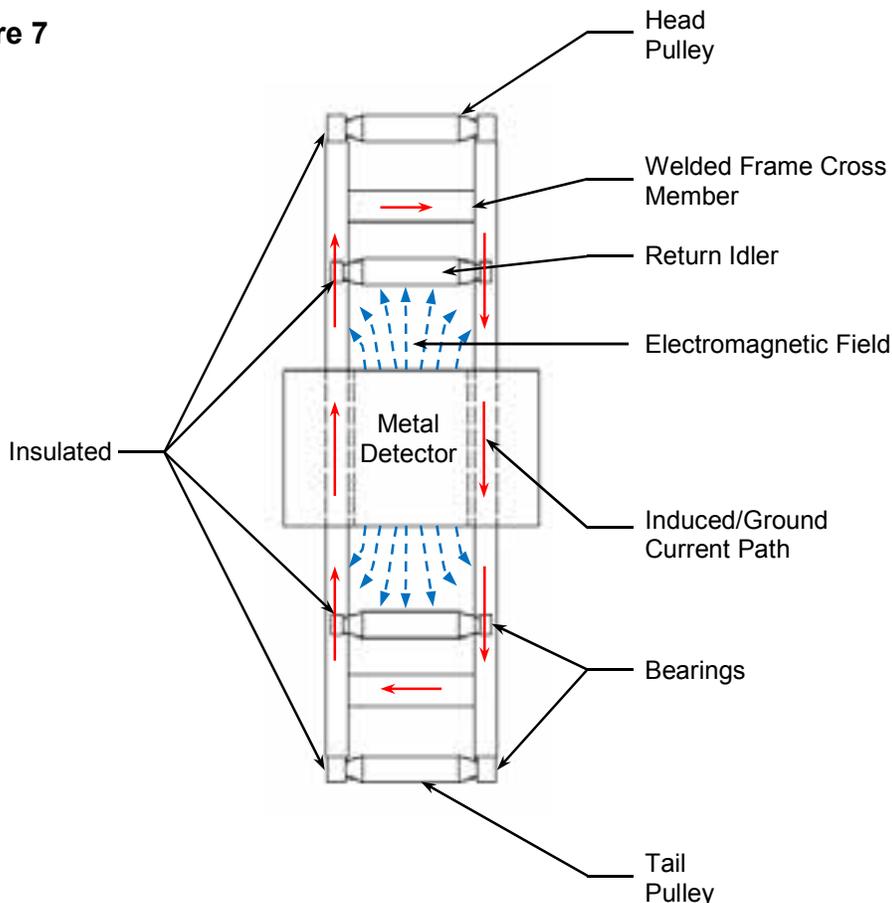
## SUPPORTING STRUCTURE

The structure that supports the metal detector sensing head must be strong, rigid, and as free from vibration as possible.  Electronically, the metal detector can be configured to ignore most vibration.  Improved sensitivity can be obtained by preventing mechanical vibration from reaching the detector head.

Four insulating mounting feet are supplied with the metal detector.  These mounting feet must be used to ensure proper operation (Figure 8).  All four mounting feet must sit flat on the supporting structure.  Do not draw the feet down to the structure by tightening the mounting bolts as this will put uneven stresses on the sensing head shell which in turn may cause instabilities in operation.  If the mounting feet do not rest flat on the supporting structure, shim with appropriate washers until supported evenly.

**Figure 8**

Metal Free Area

Belt

Conveyor Frame

Metal Detector

Insulating Mounting Foot

Supporting Structure

SS Washer

SS M8-1.25 Bolt
(M10 for larger units)
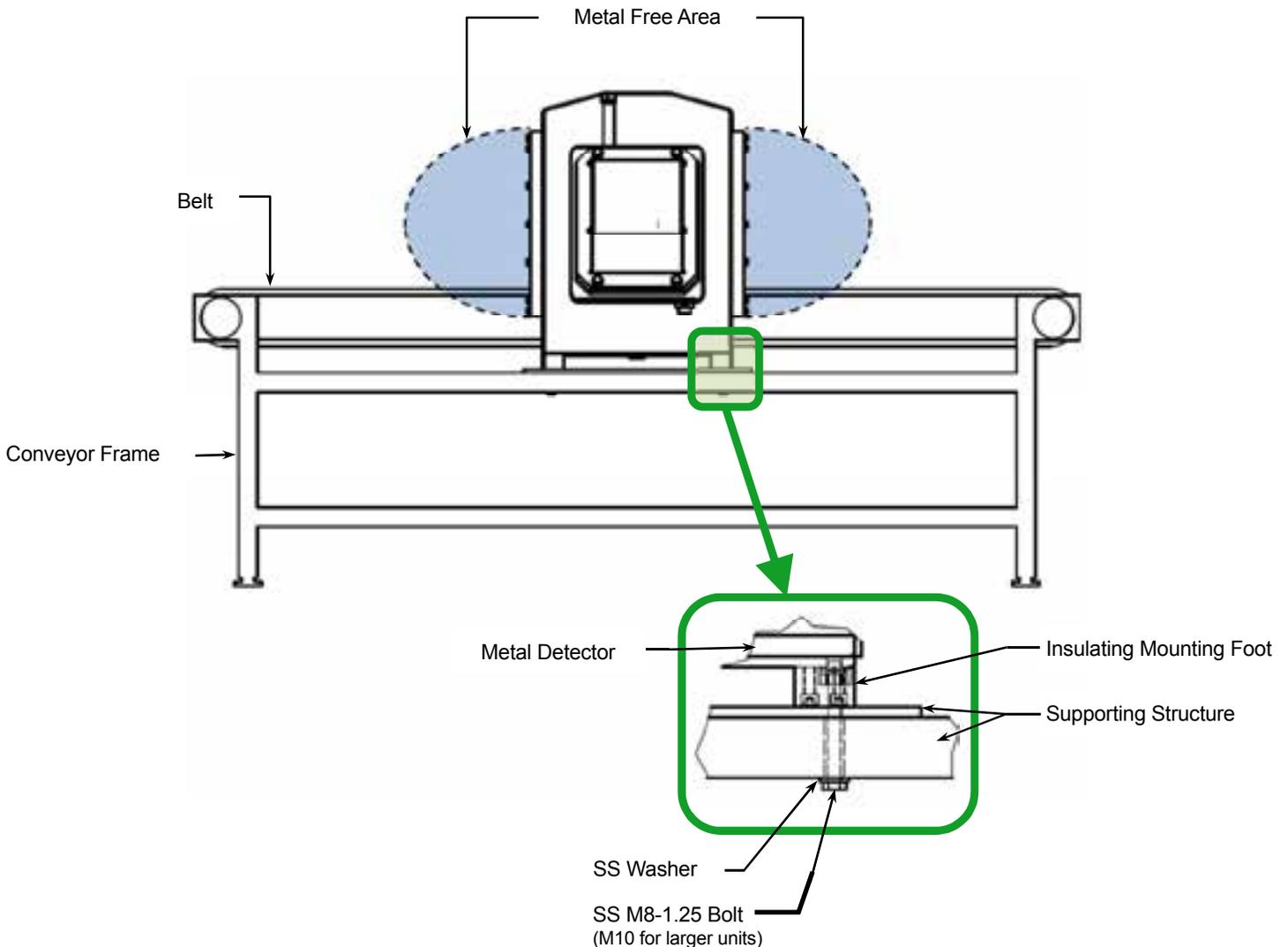
NOTE:

Only the insulating mounting feet and electrical connections should contact the sensing head.  Conduit attached to the metal detector sensing head should utilize plastic fittings (refer to Electrical Installation).

## BELTS AND BELT SPLICES

The metal detector's sensing head cannot be disassembled to be fitted around an endless conveyor belt.  The conveyor must be designed to return the belt through the aperture, or the belt must be cut and spliced (non-metallic) back together.  Splicing the belt with lacing or clamps is not recommended since foreign materials tend to collect at the joint and may eventually cause false detections.

A proven, trouble free choice for metal detector conveyor belts are modular plastic conveyor belts.  Eriez recommends and uses this option as they are easily maintained and faulty sections can be changed out quickly.  Conductive plastic components, belts, and metallic hinge pins or rods must be avoided.  Vulcanized belt splices are the most reliable and are recommended for continuous belt applications where plastic chain cannot be used (Figure 9).  If the belt is single-ply, the finger splice configuration should be used.  If the belt is multi-ply, a diagonal bevel or step splice configuration is recommended.

**Figure 9**



| Finger Splice Single-Ply | Step/Finger Splice Two-Ply | Diagonal Bevel or Step Splice | Straight Bevel or Step Splice |

Not Preferred for Apertures under six inches high

Recommended for All Apertures

Not Recommended
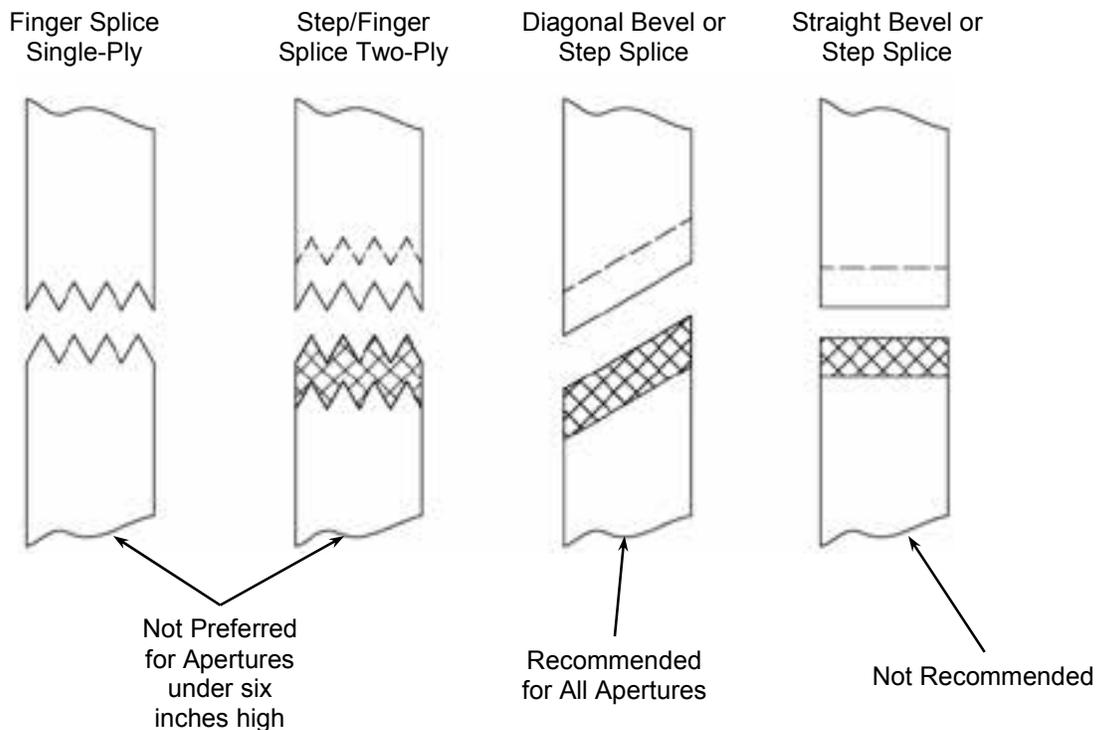
NOTE:

During all splicing it is absolutely necessary to ensure that no foreign material (especially metal) is trapped within the splice. If metal is trapped in the splice the detector will trip each time the splice passes through the aperture. Since the metal is trapped inside the splice, it cannot normally be located and removed without ruining the belt.

**CONVEYOR SLIDER BED**

The conveyor belt must be supported as it travels through the metal detector. This is accomplished by providing a stationary slider bed which must be capable of holding the belt off the aperture liner when fully loaded. The slider bed must not touch the aperture liner.

The slider bed should be made of static-resistant non-metallic material. Anti-static UHMW and phenolic are acceptable choices. Eriez has designed and incorporated a static-dissipative food grade plastic slider bed into our standard and custom metal detector conveyor systems. Most solid plastics cannot be used because these materials tend to generate static electricity as the conveyor belt slides across. "Static-resistant" plastics that incorporate metallic particles cannot be used.

**PRODUCT POSITION**

The product should always be guided through the center of the aperture, both vertically and horizontally. The product must be centered regardless of the method of conveyance through the metal detector (i.e. conveyor, chute, or vertical pipe). If the same metal detector will be used to inspect multiple products with differing sizes, design the system to center the largest product in the aperture. In such a case be aware that the sensitivity of the detector to metal of a particular size and type may vary with the product position, and may require different detector settings for the different product sizes and positions in the aperture.

**REJECT PROXIMITY SWITCH**

A proximity switch indicates when a package is aligned with a reject device. For example, a product in a box may need to align with a reject device such as a pusher arm. Reliable rejection requires that the proximity switch indicate when the alignment is achieved. The normal position for the proximity switch is before the reject device. The metal detector incorporates a timer capable of delaying the output until the product aligns with the reject device. Be certain not to infringe on the required detector "metal-free" area when choosing the location of the proximity switch.

# ELECTRICAL INSTALLATION

**FIGURE 1: TERMINAL CONNECTIONS**
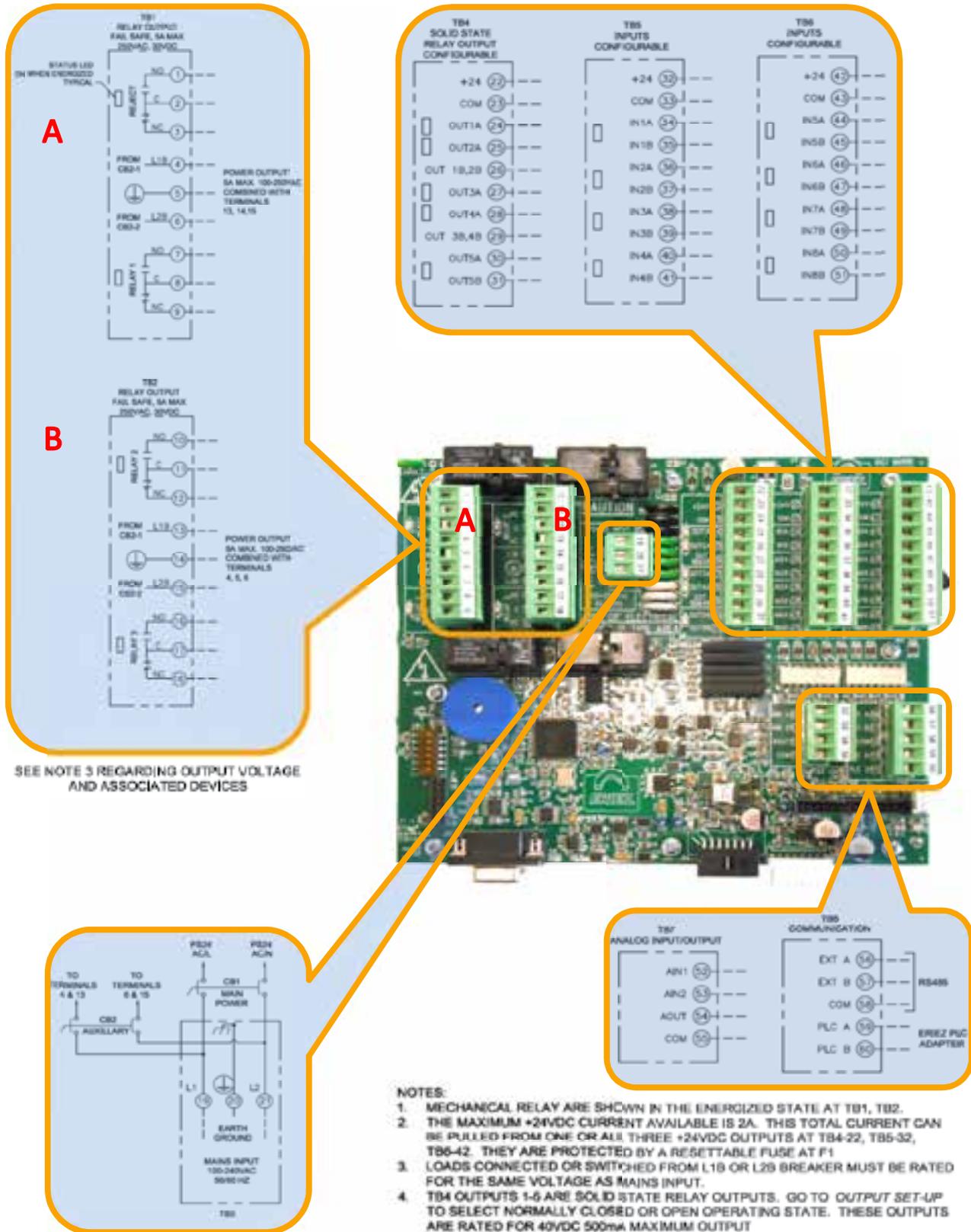


SEE NOTE 3 REGARDING OUTPUT VOLTAGE AND ASSOCIATED DEVICES

NOTES:

1. MECHANICAL RELAY ARE SHOWN IN THE ENERGIZED STATE AT TB1, TB2.
2. THE MAXIMUM +24VDC CURRENT AVAILABLE IS 2A. THIS TOTAL CURRENT CAN BE PULLED FROM ONE OR ALL THREE +24VDC OUTPUTS AT TB4-22, TB5-32, TB6-42. THEY ARE PROTECTED BY A RESETTABLE FUSE AT F1
3. LOADS CONNECTED OR SWITCHED FROM L1B OR L2B BREAKER MUST BE RATED FOR THE SAME VOLTAGE AS MAINS INPUT.
4. TB4 OUTPUTS 1-6 ARE SOLID STATE RELAY OUTPUTS. GO TO *OUTPUT SET-UP* TO SELECT NORMALLY CLOSED OR OPEN OPERATING STATE. THESE OUTPUTS ARE RATED FOR 40VDC 500mA MAXIMUM OUTPUT
5. ALL INPUT FUNCTIONS ARE CONFIGURABLE. FUNCTION SELECTION IS MADE IN THE *INPUT SETUP* SECTION.

PROTECTIVE CONDUCTOR

**ERIEZ Xtreme METAL DETECTOR**

**FIGURE 2: INFORMATION TOWER**

NOTE: The light indicators on the Information Tower are configurable via the "Output Configuration" Screen. (shown is default configuration)

Fault Indicator

Warning Indicator

Healthy Indicator

Reject Indicator

Not Used

Buzzer Volume Adjustment

FAULT INDICATION RED

WARNING INDICATION AMBER

HEALTHY INDICATION GREEN

REJECT INDICATION BLUE

NOT USED WHITE

BUZZER

TB4
SOLID STATE RELAY OUTPUT CONFIGURABLE

+24 (22)
COM (23)
OUT1A (24)
OUT2A (25)
OUT 1B,2B (26)
OUT3A (27)
OUT4A (28)
OUT 3B,4B (29)
OUT5A (30)
OUT5B (31)

RED — (6) RED
ORANGE — (4) AMBER
GREEN — (3) GREEN
BLUE — (7) BLUE
(1) WHITE
PURPLE — (2) BUZZER
YELLOW — (5) POWER

ELECTRICAL

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# FIGURE 3: OUTPUT CONNECTION EXAMPLES

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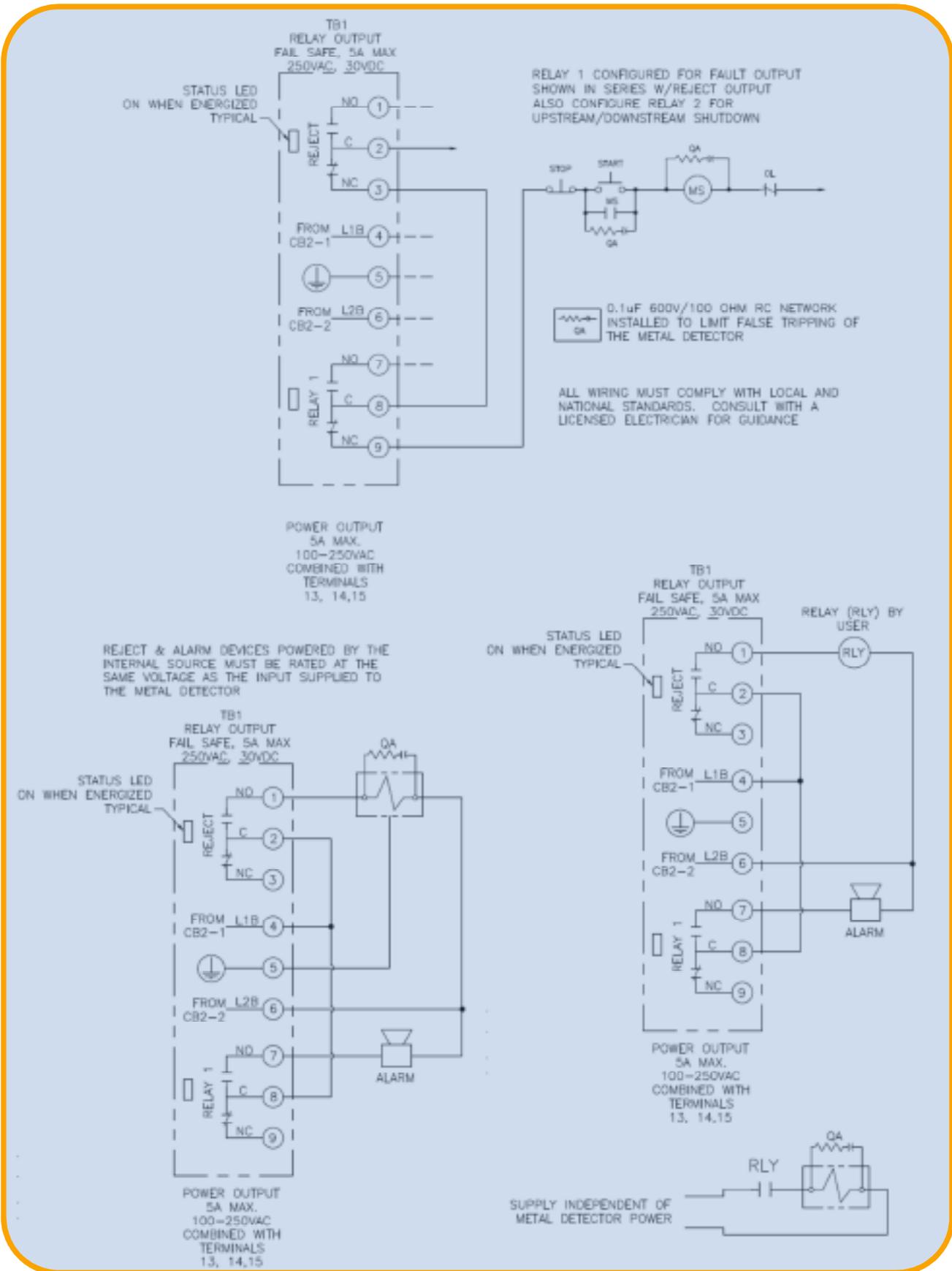
**FIGURE 4: INPUT CONNECTION EXAMPLES**
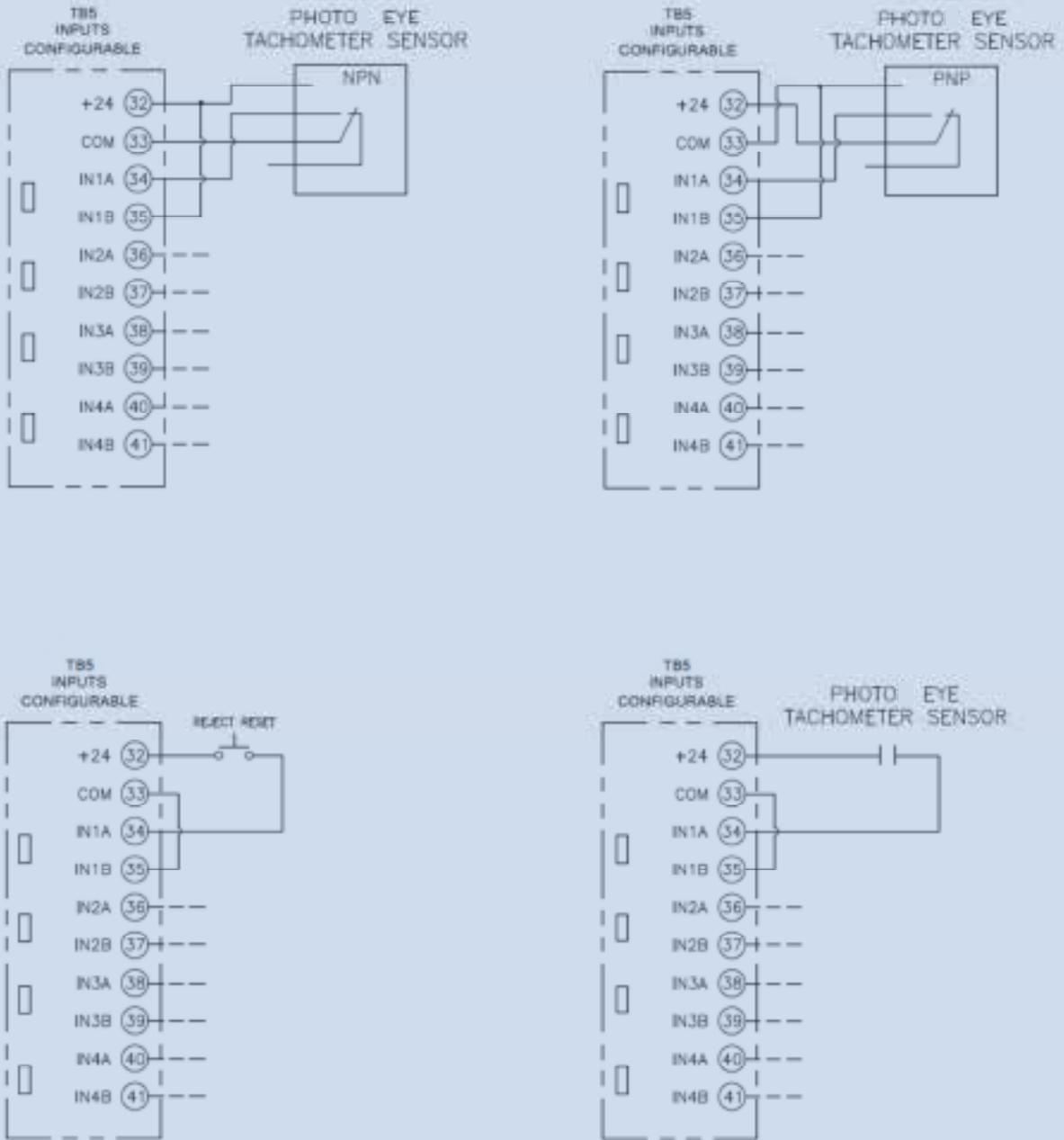
NOTE: Verify input device power requirements before making any connections.

## INTRODUCTION

All electrical connections are made within the control enclosure.  **Figure 1** shows the IOC PCB and the electrical connections to the circuit board.  For convenience, connections are pull-apart terminal blocks.  The pull-apart feature allows the connections to be made outside the enclosure and then snapped back in place.  **Figures 2-4** show example connections for input/output devices and power connections to the metal detector.

## CHOICE OF INPUT POWER SOURCE

The wiring from the mains supply panel to the metal detector should be a minimum of 14 AWG and should include a dedicated earth ground wire for safety and proper operation of the metal detector.  The power wiring should be run in a dedicated conduit.  The best insurance against electrical noise and false tripping is to run a separate circuit to the metal detector from the main power bus.  This circuit should be free of all loads except the metal detector.  If this is impractical, reliable operation can often be obtained by powering the metal detector from a "clean" lighting or instrument circuit.  This circuit must be free of inductive loads such as motors, solenoids, and motor starters.  If the metal detector must be powered by a less than favorable source, a constant voltage transformer with harmonic neutralization can be used to eliminate or reduce false tripping caused by line noise.  This transformer should be mounted within 3-5 feet (1 to 1.5 meters) of the metal detector.

The power source is connected to terminals L1 and L2.  L1 and L2 are connected through auxiliary circuit breaker 2 to terminals L1B and L2B on the circuit board.  These terminals are intended to be conveniently available to the user to power various pieces of auxiliary equipment.  The circuit breaker has limited capacity as indicated in the specifications.  If a piece of auxiliary equipment requires power in excess of the circuit breaker capacity, the auxiliary equipment must be controlled from an intervening relay and powered from a separate source.

The metal detector power source must contain a reliable ground (earth) connection.  It must be connected to the protective earth terminal of the metal detector.  The metal detector should be grounded at one point through the power supply ground wire.  No other ground connections are permitted including mounting hardware and conduit.

Main Circuit Breaker 1 protects the metal detector electronics.  It is located on the right side of the control door inside the control housing.

The metal detector is equipped with electronic filter circuits to reduce incoming electrical noise.  Inductive loads sharing the same power circuit usually create noise.  Although there are filters, there is a limit to what the metal detector can withstand without false tripping.

**WARNING:**

L1B and L2B are not disconnected by Main Circuit Breaker 1. They are disconnected by Auxiliary Circuit Breaker 2.

NOTE: An external disconnect switch labeled "Metal Detector" should be installed near the metal detector to allow for interruption of the power to the metal detector for service or installation. In 240 VAC systems this switch should interrupt both sides of the line. This switch should include a provision to lockout the switch for service and maintenance. **Failure to follow these precautions may result in serious injury or death.**

## OUTPUT RELAYS

The Xtreme Metal Detector has four mechanical and five solid state relays for a total of nine programmable outputs, each with one set of contacts.

There are four programmable "Form C" (NO-C-NC) output relays rated at 5A up to 250 VAC or 30 VDC each. These relays are wired as fail-safe. If the power at L1B and L2B is used to power the relays, its maximum available current is 5A and the voltage will be equal to that applied at L1 and L2 on TB3. Power at L1B and L2B passes through Auxiliary Circuit Breaker 2, which is located on the left side of the control door. Connect to L1B and L2B only if the voltage and current ratings are compatible with the auxiliary device to be used.

**Reject (Relay K1)** has one set of "Form C" (NO-C-NC) contacts. It is located at terminals 1, 2, and 3 on TB1. "Reject" is the primary reject device output. "Reject" must run via Reject Timer 1 or Overhead A-B when used. All reject log information is based on Reject Timer 1 only. Reject Timer is controlled using the "Reject Setup" screen which is found on the Running Product Settings page.

**Relay 1 (Relay K3)** has one set of "Form C" (NO-C-NC) contacts. It is located at terminals 7, 8, and 9 on TB1.

**Relay 2 (Relay K2)** has one set of "Form C" (NO-C-NC) contacts. It is located at terminals 10, 11, and 12 on TB2.

**Relay 3 (Relay K4)** has one set of "Form C" (NO-C-NC) contacts. It is located at terminals 16, 17, and 18 on TB2.

There are five programmable "Form A" (SPST-NO) solid state relays each rated at 500mA up to 40 VDC. These relays can be wired as NPN or PNP. The output can be set to NO or NC under normal running conditions. If +24V is used to power the relays

the maximum current available is 2A.  This current rating is controlled by a resettable fuse (F1).  Only connect +24V if the voltage and current ratings are compatible with the auxiliary device being used.

**Out 1 (Relay K9)** has one set of "Form A" (SPST-NO) contacts.  It is located at terminals 24 and 26 on TB4.

**Out 2 (Relay K8)** has one set of "Form A" (SPST-NO) contacts.  It is located at terminals 25 and 26 on TB4.

**Out 3 (Relay K7)** has one set of "Form A" (SPST-NO) contacts.  It is located at terminals 27 and 29 on TB4.

**Out 4 (Relay K6)** has one set of "Form A" (SPST-NO) contacts.  It is located at terminals 28 and 29 on TB4.

**Out 5 (Relay K5)** has one set of "Form A" (SPST-NO) contacts.  It is located at terminals 30 and 31 on TB4.

Relay 1 - Relay 3 and Out 1 - Out 5 are fully programmable and may use any of 8 reject timers or Overhead A-B.  They can also be used as a fault or warning output.  Relay 1- Relay 3 and Out 1- Out 5 are controlled using the "Reject Setup" screen which is found on the Running Product Settings page.

## RELAY NOTES

If switched power is needed for an external device in excess of the 5A 240VAC source or the 2A 24VDC source, it must be supplied from an external source using an auxiliary relay.  The voltage and ampere ratings for devices switched by the relays should not exceed the relay ratings.

## TACHOMETER INPUT

Applications having variable speed product flow and requiring automatic reject timing use this input.  A tachometer is used to allow the metal detector control to monitor product speed, and reject according to the distance the product has traveled rather than according to elapsed time since detection.
Electrical requirements are listed in the Specifications Section.

## PROXIMITY SWITCH

The metal detector can also be used to scan and automatically reject packages.  In this application a proximity switch is used to sense the location of the package so it can be

reliably rejected.  The device can be a mechanical switch, photo-eye, or any other device that is capable of precisely locating the package.

Electrical requirements are the same as the Tachometer input which is listed in the Specifications Section.

NOTE:  Terminals 22, 33, and 43 of this input are DC common.  Since the metal detector is grounded only by the input power supply ground, this terminal must not be connected to earth ground by the proximity device.

**REJECT CONFIRMATION**

The reject confirmation input is used to monitor the function of the reject device.  It is usually a limit switch attached to the reject device that indicates it is functioning.  If for example you were using a pusher bar, the reject confirmation switch would be wired to the reject confirmation input and positioned in such a way that it closes as the pusher bar reaches maximum extension.

Electrical requirements are the same as the Tachometer input which is listed in the Specifications Section.

NOTE:  Terminals 22, 33, and 43 of this input are DC common.  Since the metal detector is grounded only by the input power supply ground, this terminal must not be connected to earth ground by the Reject Confirmation device.

**REJECT RESET**

The metal detector has eight reject timers. Each timer has the option of being set to either manual or automatic reset mode.  Manual Reject Reset is typically used for a stop belt reject. When a timer is set to manual reject reset and a rejection occurs, a password protected button will appear at the bottom center of the screen to reset the metal detector. Another option is to wire a reject reset button to one of the eight input connections to reset the timer. Typically a momentary push-button switch is used for this purpose. The logic can be set to either NO or NC and the specific input selected. When either manual reset is performed all reject times that are set to manual reset will be reset.

The electrical specifications are as follows:

Voltage:
Logic 0: 0 to 0.9VDC
Logic 1: 10 to 30VDC

Current: 20mA

## CONDUIT

Wiring to and from the metal detector should be routed through conduit. High voltage wiring for the power supply and reject devices should not be located in the same conduit as low power sensor wiring (i.e. tachometer and reset switch). Keep all metal detector wiring separate from electrical supplies carrying heavy or switched loads. This is especially important for variable speed motor control wiring. Interference from electrical noise can be greatly decreased by following these guidelines.

The use of metal conduit has the potential to create a ground path unless plastic fittings are used to attach the conduit to the metal detector housing. Always use a plastic fitting for this purpose to avoid potential false trips.

## POWER SWITCH

The on-off circuit breakers/switches located inside the control enclosure are intended to be a service convenience only. It is recommended that the metal detector remain ON at all times to provide optimum performance. This also enhances the longevity of the electronic components.

## HOLEPLUGS

On the bottom of the control there are six conduit entry holes. Five of these holes have Type (NEMA) 4X rated plugs installed at the factory. The sixth hole has a plastic plug installed. The plastic plug must be removed and if any other plugs are removed they shall be replaced with a Type (NEMA) 4X non-metal conduit fitting.

In order to maintain the Type (NEMA) 4X rating the plugs must be installed properly. Once installed and snug, turn the wing nut one and one-half turns or more to compress the rubber gasket. Visually check to ensure the gasket is compressed.

# MENU MAP

PASSWORD LEVEL HEIRARCHY
E – Engineer = 4444
S – Supervisor = 3333
Q – Quality Control = 2222
O – Operator = 1111
NOTE: Symbol in upper right corner denotes minimum password level required to view that screen.

USER INTERFACE

p27 **Task Bar** O

p28 **Fault** O
p29 **User Login** O

p30 **Menu** O

p31 **Home** O
p32 **Product Setup** O
p33 **I/O Setup** E
p34 **HMI Setup** O
p35 **Diagnostics** S
p36 **About** O

p37 **Quality Control** O
p38 **Product Settings** S

p44 **Display Settings** Q
p45 **User Management** Q
p46 **User Settings** O

p52 **Boundary Setup** S
p53 **Reject Setup** E

p54 **Advanced Reject Setup** E

p40 **Input Configuration** E
p42 **Network Configuration** E

p39 **Fault Configuration** E
p41 **Output Configuration** E
p43 **PLC Configuration** E

p47 **Event Log** O
p48 **Reject Log** O
p51 **Validation Screen** Q

p49 **Validation Details** Q
p50 **Validation Schedule** Q
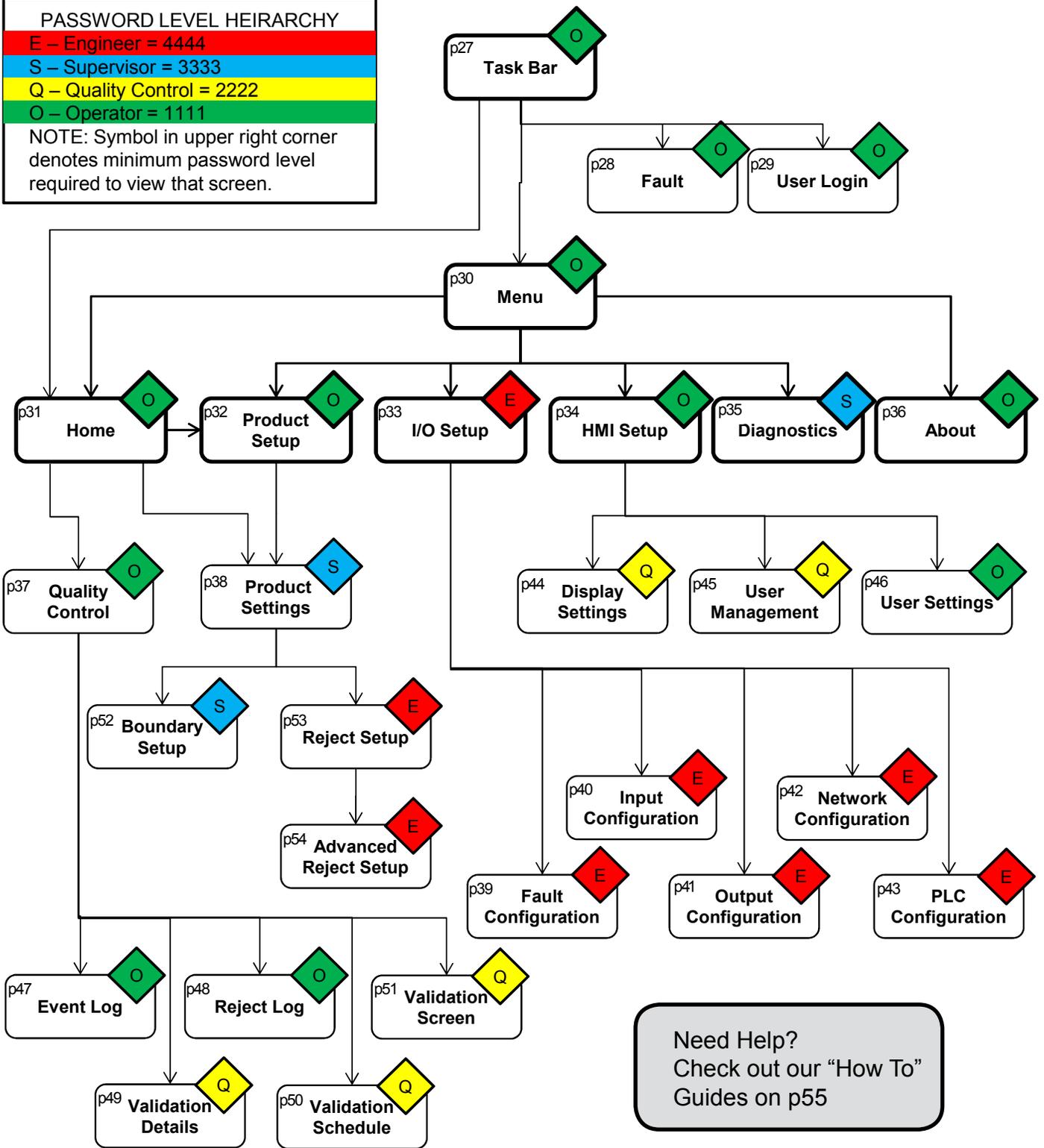
Need Help?
Check out our "How To"
Guides on p55

ERIEZ

# TASK BAR

NOTE: The Task Bar is accessible from all screens.

**Home Button**
Home p31

**Login Level/User**
User Login p29

**Indicates Touch Screen is depressed**

**Indicates Detector is in Detect**

**Name of Current Screen**

**Time and Date**
Set via Display Settings p44

Home Screen

11:19
9/4/2013

**Menu Button**
Menu p30

**Forward and Back Buttons**

**Indicates Detector is in Reject**

**Indicates Detector is writing to a file**

**Denotes User Login Level**

**Warning Indicator**
(Overlays Time/Date)
Fault Screen p28

Warning

RESET REJECT

Validation Needed

Fault

**Manual Reset Reject Button**
(Overlays Current Screen Name)
Advanced Reject Setup p54

**Indicates a Validation Check is needed**
Validation Screen p51

**Fault Indicator**
(Overlays Time/Date)
Fault Screen p28

View "How To" Guides

ERIEZ
Xtreme
METAL DETECTOR

# CURRENT FAULTS

| Description | Type | Level |
|---|---|---|
| Data485 error with Amo | Iop | Warning |
| Communication error with Amo | Iop | Fault |

**Fault Description**

**Fault Type**

**Fault Level**
see Fault Configuration for more options p39

Eriez Magnetics Headquarters
2200 Asbury Road
Erie, PA 16506-1440 USA
Phone: (814) 835-6000
Web: www.eriez.com

Clear Faults

511.93 mS

Engineer

D R

Current Faults

⚠ Fault

⚠ Warning

**Eriez Contact Information**

**Clear Faults Button**
requires "Engineer Level"

**Fault and Warning Indicator Buttons**

NOTE: If a Fault and Warning have both occurred the Fault Indicator will take precedence over the Warning Indicator.

View "How To" Guides

USER INTERFACE

# USER LOGIN

**Enter Password**

Selected User: Engineer

Entered Value: [ ]

0    to    9999

| 7 | 8 | 9 |
| 4 | 5 | 6 |
| 1 | 2 | 3 |
| 0 |

Delete

Clear

Ok    Cancel

Select User:

| User Name | Level |
|-----------|-------|
| Operator | Operator |
| QC | QC |
| Supervisor | Supervisor |
| **Engineer** | **Engineer** |

Page:1 of 1

**Enter a maximum 4 digit Password**

**Default Users**
User Management Screen for more options p48

**Forward and Back Buttons for additional User Name pages**

NOTE: Entering an incorrect password will revert you to the "View" level. The "View" level has no user functionality.

View "How To" Guides

# MAIN MENU



MAIN MENU

Home — Displays Graphing Features and commonly used functions p31

Product Setup — Adds/Deletes/Modifies Products and selects "Running Product" p32

I/O Setup — Configures Faults/Inputs/Outputs/Network Requires "Engineer Level" to view p33

HMI Setup — Modifies display and user login options p34

Diagnostics — Displays circuit board diagnostic information Requires at least "Supervisor Level" to view see p35

About — Displays software versions p36

NOTE: The Main Menu is accessible from most screens.

USER INTERFACE

# HOME SCREEN

**View and edit boundary/reject setup/belt speed/frequency**
Requires at least "Supervisor Level" to view

**Running Product Settings**

**Product Setup**

**Quality Control**

**Zoom In and Out**

**Boundary (green)**

MD Signal          Polar

180          10.0   20.0   30.0   0

225          315

270

**Zooms to product signal or boundary setting**

**View Event/Reject Log and Validation Info**

**Adds/Deletes/Modifies Products and selects "Running Product"**
see p32

**Starts and pauses live graphing feature**

**Product Signal (red)**

NOTE: This is the default screen when the detector is initially turned on.

View "How To" Guides

ERIEZ Xtreme
METAL DETECTOR

# PRODUCT SETUP

**Product Name**

Copy

🏃 PRODUCT NAME

**Current Product Selection**

<- Click to run the selected product

**Press to make current selection the running product**

**Makes an exact copy of selected product**

**Denotes running product**

New    Clone

**Runs New Product Wizard**
p56

Delete    Edit    Backup Restore

:1

**Deletes selected product**
Requires "Engineer Level" to view

**Allows editing of product name and setup**
Requires at least "Supervisor Level" to view

**Performs backup of system files and restores product settings**
Requires "Engineer Level" to view

View "How To" Guides

# I/O SETUP



**Allows enable/disable of faults and selection of priority level**

**Pressing the I/O Setup button displays the submenu to the right**

**Sets up input devices**

**Sets up output devices**

**Sets up network settings**

**Sets up PLC settings**
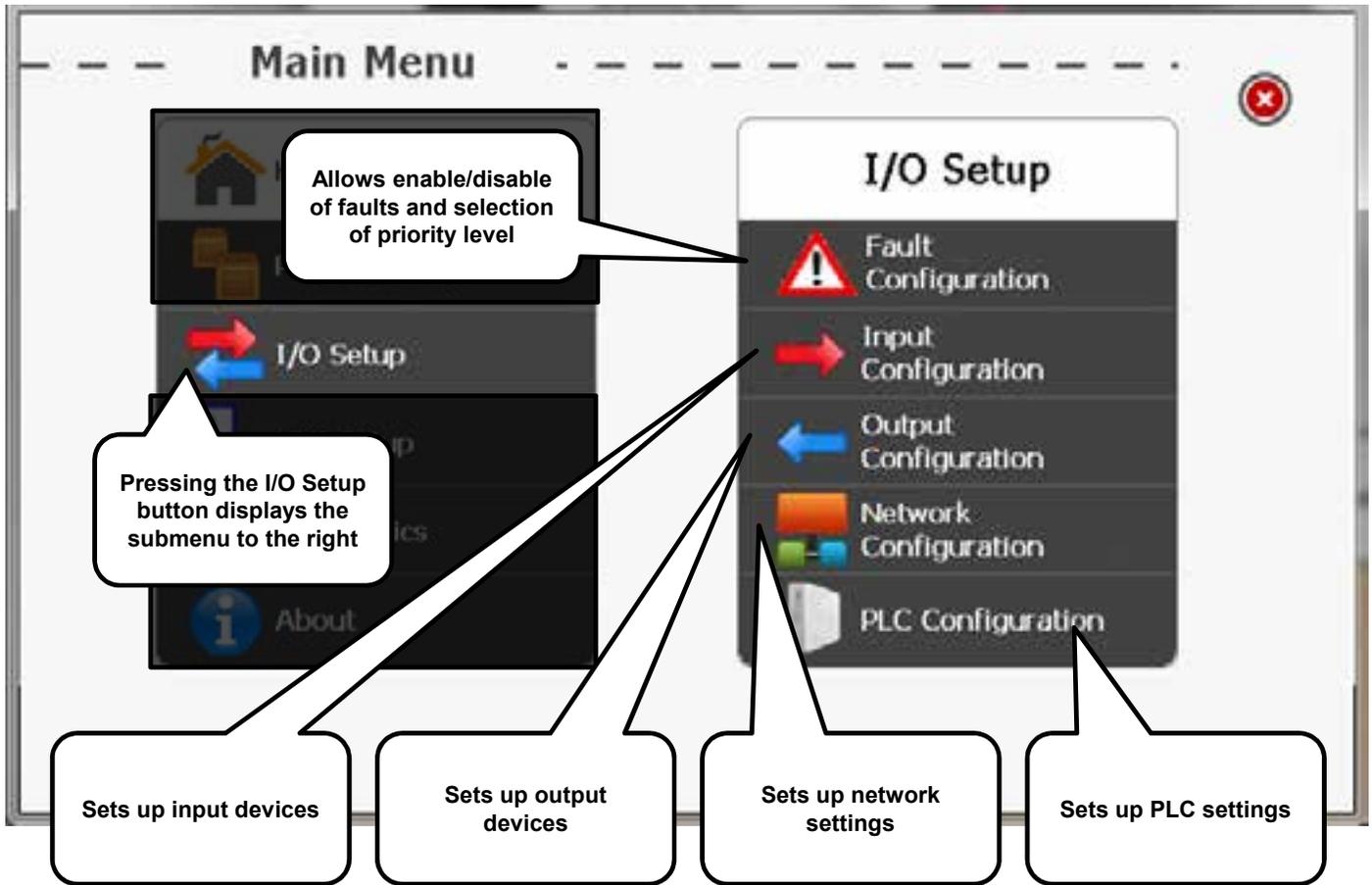
NOTE: This screen requires "Engineer Level" to view.

View "How To" Guides

# HMI SETUP

**Main Menu**

Home

Setup

HMI Setup

Diagnostics

About

**Allows you to change YOUR password**

**HMI Setup**

User Settings

User Management

Display Settings

**Pressing the HMI Setup Button displays the submenu to the right**

**Allows addition, deletion, and changes to USERS**
Requires at least "QC Level" to View

**Allows adjustment of date/time, screen brightness, and password timeout**
Requires at least "QC Level" to View

View "How To" Guides

# DIAGNOSTIC SCREEN

Reference Signal

Amo Board

Ioc Board

Iop Board

**Troubleshooting Feature for use with Factory Technician**

Sensitivity: 0.1 %
Last Mag: 0.01 V
BC nts: 288
Phas ev: -78.2
Last se: 61.7 °
Pha Rot: 0.0 °

Remote Access Status

**Green Light indicates remote support option is available.**

**Troubleshooting Feature for use with Factory Technician Default is ON**

neer

Diagnostic Screen

9:36
9/22/2013

NOTE: Remote Support capability requires that a static IP Address be assigned to the Metal Detector and a Secure Gateway (Purchased Separately) be connected to your LAN..

NOTE: This screen requires at least "Supervisor Level" to view.

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# ABOUT SCREEN

Eriez Magnetics Xtreme

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Eriez Magnetics Headquarters
2200 Asbury Road
Erie, PA 16506-1440 USA
Phone: (814) 835-6000
Web: www.eriez.com

Metal Detector Information

Serial#:  123456

Software Versions:

| | |
|---|---|
| Iop Main: | 2013C13A |
| Amo Core: | 2013A30A |
| Amo Main: | 2013B27A |
| Ioc Core: | 2013A30A |
| Ioc Main: | 2013B15A |
| Uboot: | 2013B22A |
| OS: | 2013B22A |
| Remote Server: | 2013C03B |
| Plc IModule: | 2013A30A |

OK

**Eriez Contact Information**

**Pressing "OK" will return you to the "Main Menu"**

**Current Software Versions and Detector Serial Number**

View "How To" Guides

# QUALITY CONTROL SCREEN

System Logs

**View Event Log**

Validation Overview

Enable Validation

**Shows Validation Overview Information when enabled**

Event Log

**Press to enter Validation Scheduling p50**

Validation Schedule

22

Validation Details

**Press to enter Validation Details** Requires at least "QC Level" p49

Reject Log

Next Validation
09/22/2013
15:00:00

Validate Now

Last Validation
09/22/2013
10:20:05

**View Reject Log**

**Shows the next scheduled validation**

**Initiates Validation Test** Requires at least "QC Level" p51

**Shows last validation time/date**

NOTE: The validation window opens the set number of minutes prior to the next validation check and closes at the time when the validation check is overdue. A warning will be displayed when the window opens and a fault when it closes if the validation check was not completed.

View "How To" Guides

USER INTERFACE

# PRODUCT SETTINGS



Edit Product Name

Edit Belt Speed
Ensure physical belt speed matches

Selects Frequency

Setup reject devices and timing

Allows manual editing of boundary settings

Performs Auto Setup of Boundary

NOTE: This screen requires at least "Supervisor Level" to view.
Some features of this page require "Engineer Level".

View "How To" Guides

# FAULT CONFIGURATION

| Description | Type | Level | Enable |
|---|---|---|---|
| Reject log approaching capacity | Iop | Warning | Yes |
| Event log approaching capacity | Iop | Warning | Yes |
| Reject log overwriting old entries | Iop | Fault | Yes |
| Event log overwriting old entries | Iop | Fault | Yes |
| Reject device confirmation | Ioc | Fault | Yes |

Enabled
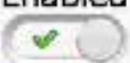
Level

**Enables/Disables Notifications**
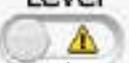
**Sets Notification Level (Warning/Fault)**

9:38
9/9/2013

USER INTERFACE

NOTE: If a Fault and Warning have both occurred the Fault Indicator will take precedence over the Warning Indicator.

NOTE: This screen requires "Engineer Level" to view.

View "How To" Guides

# INPUT CONFIGURATION

| Name | Function | Active State | Description |
|------|----------|--------------|-------------|
| In_1 | Reject Device Con... | High | REJECT PHOTO EYE |
| In_2 | Undefined | High | Test |
| In_3 | Undefined | High | Front proxy |
| In_4 | Undefined | High | Back proxy |
| In_5 | Undefined | High | TACH |
| In_6 | Undefined | High | Input_6 |
| In_7 | Undefined | High | Input_7 |
| In_8 | Undefined | High | Input_8 |

| Function | Reject Device Confirmation |
|----------|---------------------------|
| Description | REJECT PHOTO EYE |
| Debounce | 2 (mS) |

Active State

**Selects inputs' function**

**Press to edit input description**

**Press to edit Debounce timing**

**Selects Active Low/High**

NOTE: This screen requires "Engineer Level" to view.

View "How To" Guides

# OUTPUT CONFIGURATION

| Name | Function | Normal State | Description |
|------|----------|--------------|-------------|
| Reject | RejectTmr | Failsafe | Air blast |
| Relay_1 | OutputTmr_1 | Failsafe | Light |
| Relay_2 | Undefined | Failsafe | Red |
| Relay_3 | Undefined | Failsafe | Overhead front |
| Out_1 | OutputTmr_3 | Normally_Open | Over back |
| Out_2 | Undefined | Normally_Open | Over front |
| Out_3 | Undefined | Normally_Open | Green |
| Out_4 | Undefined | Normally_Open | yellow light |

| Function | OutputTmr_3 |
|----------|-------------|
| Description | Over back |

**Active State**

**Selects output timer or fault/warning**

**Press to edit outputs' description**

**Selects normally open or normally closed**

Output Configuration

ineer

13

"Reject" functionality is limited to "Reject Timer" or "Overhead A-B".

NOTE: This screen requires "Engineer Level" to view.

View "How To" Guides

# NETWORK CONFIGURATION

Gateway | 10 | . | 0 | . | 0 | . | 1

**Edit Gateway**

IPAdr | 192 | . | 168 | . | 11 | . | 13

SubnetMask | 255 | . | 255 | . | 0 | . | 0

Update

**Edit Subnet Mask**

**Updates and applies changes to settings**

**Edit Static IP Address**

10:30
9/9/2013

NOTE: This screen requires "Engineer Level" to view.

View "How To" Guides

USER INTERFACE

# PLC CONFIGURATION

| Num | Product Name |
|-----|--------------|
| 1 | Apples |
| 2 | Bananas |
| 0 | Cherries |
| 3 | Mangos |
| 0 | Oranges |

Page:1 of 1

**Select Product to Edit Number for PLC use**

Engineer

**Number** — 3

**Edits Product Number**

**IPAdr** 10 . 10 . 10 . 10

**Subnet Mask** 255 . 255 . 255 . 0

**Gateway** 0 . 0 . 0 . 0

**Edits PLC Networking Settings and Updates to take effect**

Update

**Status** IModule PLC

**Connection Status of IModule and PLC (Red= Not Connected) (Green= Connected)**

NOTE: This screen requires "Engineer Level" to view.

View "How To" Guides

# DISPLAY SETTINGS

NOTE: Time is set using a 24 hour clock. (Military Time)

NOTE: This screen requires at least "QC Level" to view.

# USER MANAGEMENT

| Name | Level | Password | New |
|------|-------|----------|-----|
| Engineer | Engineer | 4444 | |
| Operator | Operator | 1111 | |
| QC | QC | 2222 | |
| Supervisor | Supervisor | 3333 | |

✓ Show Passwords

Page:1 of 1

Delete

Edit

**Select to show Users passwords**
Only shows passwords at your level and below

**Creates New User**

**Deletes User**

**Edits User**

NOTE: You may only create/delete/edit Users at your level and below.

NOTE: This screen requires at least "QC Level" to view.

View "How To" Guides

# USER SETTINGS

PASSWORD

| | |
|---|---|
| Current | * |
| New | * |
| Confirm | * |

Update Password

Allows User to change their password

Updates password once Current, New, and Confirm blocks have been filled

11:43
9/9/2013
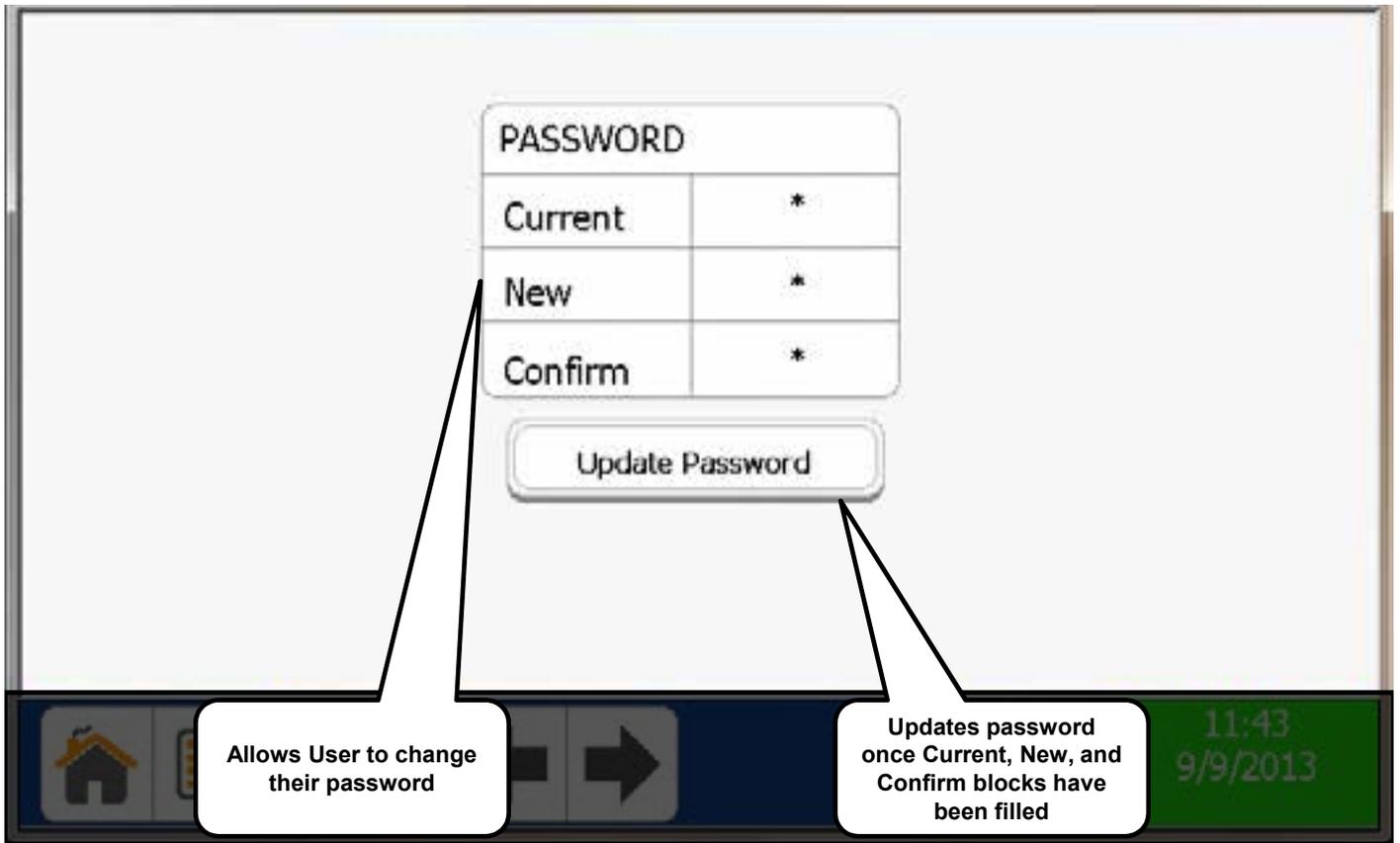
View "How To" Guides

# EVENT LOG SCREEN

| Date | Time | User | T... | Label | Description | Old | New |
|------|------|------|------|-------|-------------|-----|-----|
| 09/06/13 | 11:14:50 | | G | User Change | | Operator | Engineer |
| 09/06/13 | 11:14:43 | | G | User Change | | Engineer | Operator |
| 09/06/13 | 08:51:32 | | G | User Change | | Supervi... | Engineer |
| 09/06/13 | 08:51:12 | | G | User Change | | QC | Supervi... |
| 09/06/13 | 08:51:06 | | G | User Change | | Operator | QC |
| 09/06/13 | 08:51:00 | | G | User Change | | Engineer | Operator |
| 09/05/13 | 09:09:59 | | G | User Change | | View | Engineer |
| 09/05/13 | 09:02:24 | | G | User Change | | Supervi... | Engineer |
| 09/05/13 | 09:02:17 | | G | User Change | | QC | Supervi... |
| 09/05/13 | 09:02:12 | | G | User Change | | Operator | QC |

**Type of Event**

**If event caused a change, old and new settings will be displayed**

Page:1 of 16

Clear

Capacity

Export

**Clear Event Log**
Requires at least "QC Level"

**Turn on/off auto refresh of event log**

**Event Log will hold 1000 entries**

**Export Log to USB stick**
Requires at least "QC Level"

View "How To" Guides

# REJECT LOG SCREEN

| Date | Time | Name | T.. | Phz | Mag | Detect |
|---|---|---|---|---|---|---|
| 09/06/13 | 09:29:31 | PRODUCT NAME | B | 134.1 | 40.2 | 7.2 |
| 09/06/13 | 09:29:16 | PRODUCT NAME | B | 297.0 | 13.5 | 3.0 |
| 09/06/13 | 09:29:08 | PRODUCT NAME | B | 133.2 | 19.9 | 3.6 |
| 09/06/13 | 09:29:00 | PRODUCT NAME | B | 123.7 | 41.7 | 0.7 |
| 09/04/13 | 13:35:22 | PRODUCT NAME | B | 152.9 | 25.5 | 0.8 |
| 09/04/13 | 13:35:17 | PRODUCT NAME | B | 134.9 | 71.3 | 5.7 |
| 09/04/13 | 13:35:10 | PRODUCT NAME | B | 313.0 | 18.1 | 5.5 |
| 09/04/13 | 13:34:57 | PRODUCT NAME | B | 135.9 | 98.5 | 5.8 |
| 09/04/13 | 13:31:36 | PRODUCT NAME | B | 121.7 | 23.7 | 4.7 |
| 09/04/13 | 13:31:30 | PRODUCT NAME | B | 129.0 | 8.8 | 5.2 |

Page:1 of 78

Clear

Capacity

Export

**Clear Reject Log**
Requires at least "QC Level"

**Turn on/off auto refresh of reject log**

**Reject Log will hold 1000 entries**

**Export Log to USB stick**
Requires at least "QC Level"

View "How To" Guides

# VALIDATION DETAILS

| Product Name | Fe | NFe | SS |
|---|---|---|---|
| Copy of PRODUCT N... | 1.0 | 1.2 | 1.5 |
| PRODUCT NAME | 1.0 | 1.2 | 1.5 |

Page:1 of

| | | |
|---|---|---|
| Fe | 1 (mm) | ✔ |
| NFe | 1.2 (mm) | ✔ |
| SS | 1.5 (mm) | ✔ |

**Selects product to set validation metal sizes**

**Selects metal size in millimeters**

**Enable/Disable Metal Type**

NOTE: This screen requires at least "QC Level" to view.

View "How To" Guides

# VALIDATION SCHEDULE

Validation Scheduling

**References next validation from start when enabled or last validation when disabled**

Reference From Start ✓

**Sets reference for validation interval**

| Settings | HR | : | MIN |
|----------|-----|---|-----|
| Start Time | 8 | : | 0 |
| Interval | 7 | : | 0 |
| Window | 0 | : | 15 |
| Stop Time | 22 | : | 0 |

**Select to edit how often you wish to Validate**

**Select to edit when Validation window opens**

**Sets stop time reference for validation interval**

Validate Now

Next Validation 09/22/2013 15:00:00

**Select to Validate Running Product**

**Displays when next Validation is Due**

12:56 9/22/2013

If your company runs 24/7 it is recommended that you set the start time to 00:01 and the stop time to 23:59.

NOTE: This screen requires at least "QC Level" to view.

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ERIEZ

# VALIDATION SCREEN



PRODUCT NAME

Fe — Test — Indicates validation check passed

NFe — Test — Indicates validation check failed

SS — Test — Press to test desired metal type

Indicates validation check has not been accomplished

Validation Screen

12:51
8/20/2013
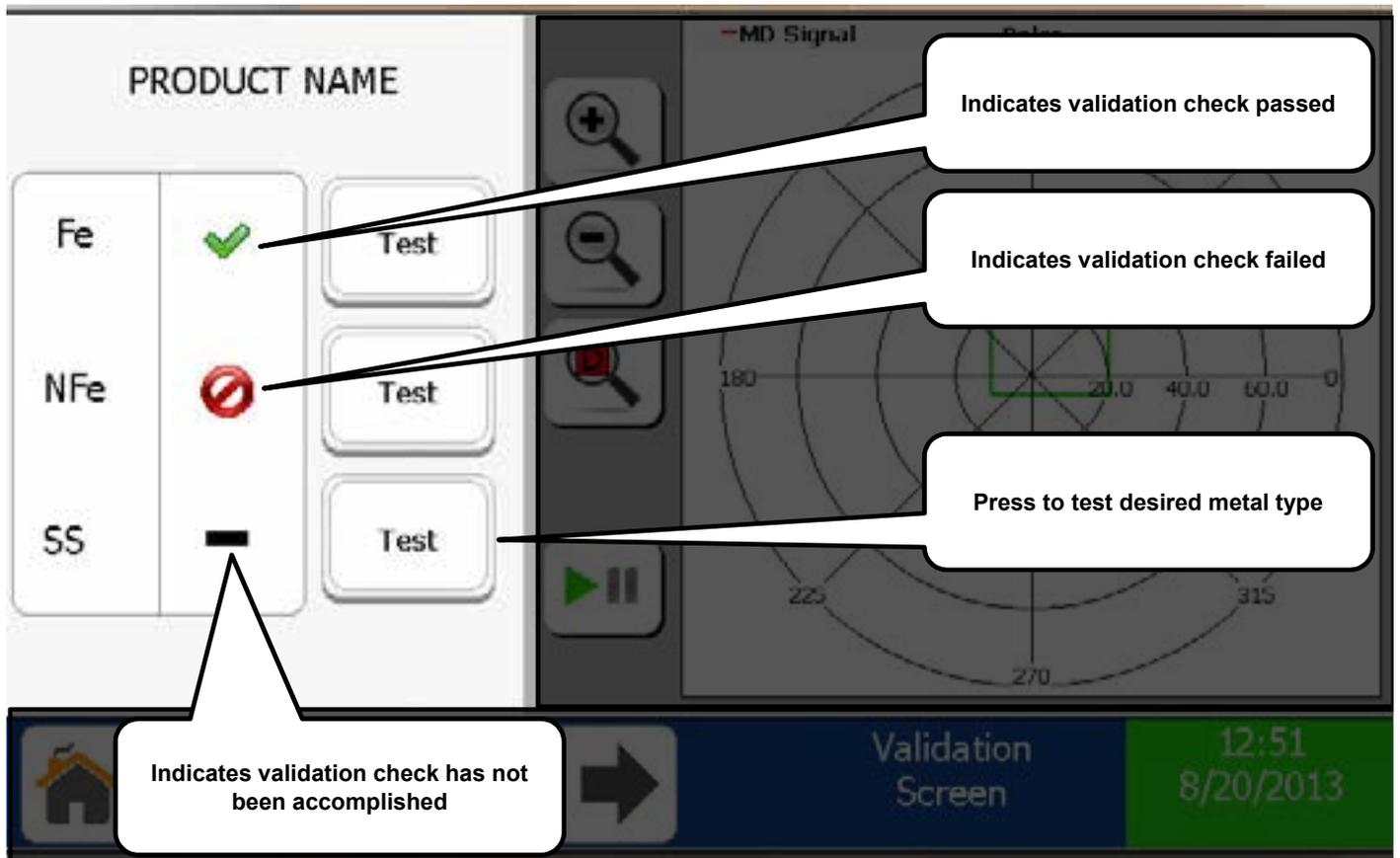
NOTE: This screen requires at least "QC Level" to view.

View "How To" Guides

# BOUNDARY SETUP

| PRODUCT NAME | |
|---|---|
| Phase | 0.0 (°) |
| Length | 15.0 (uV) |
| Width | 5.0 (uV) |
| ShiftL | 4.0 (uV) |
| ShiftW | 2.0 (uV) |

Shape — Mode

**Sets Phase angle of boundary in degrees**

**Sets Length of boundary**

**Starts Auto-Setup feature**

**Sets width of boundary**

**Shifts boundary about length axis**

**Shifts boundary about width axis**

**Toggles between ellipse and rectangle boundaries**

**Toggles between Unipolar and Bipolar Modes. Leave on Unipolar unless directed by Factory to change.**

p73 **The Detection Boundary Explained**

NOTE: This screen requires at least "Supervisor Level" to view.

View "How To" Guides

# REJECT SETUP

RejectTmr_1 (Air blast) - PRODUCT NAME

**Travel Settings**

| Travel | 0.10 (S) |
|--------|----------|

**Duration Settings**

| On Time | 5.00 (S) |
|---------|----------|
| Off Time | 0.00 (S) |

Sets travel time from detection to when reject fires

Sets on/off timing for reject device

**Select Timer**

**Advanced Options**

Setup — Copy

Advanced reject setup options see p54

−Detect  −Reject     Reject Timing     Trigger

.00 mS

**Graph Limits**

| Left | 0.00 (S) |
|------|----------|
| Right | 10.00 (S) |

0.0  1.0  2.0   4.0  5.0  6.0  7.0  8.0  9.0

Selects reject timer to view/edit

Triggers graph to acquire timing data on next reject

Copies selected timers settings

Used to setup scaling of timing window

Duration Off Time is normally used for Pusher Arm type reject devices.

NOTE: This screen requires "Engineer Level" to view.

View "How To" Guides

# ADVANCED REJECT SETUP

Space Between Products

Reject Reset
— Selects manual or automatic reject reset

Travel Time Base
Time — Tach

Duration Time Base
Time — Tach
— Duration based on internal timer or Tach

Use Index Device

Device Confirmation
— Is device confirmation being used? Yes/No

Travel Time based on internal timer or Tach

Is an index device being used? Yes/No

Is there space between products? Yes/No

Advanced Reject Settings

Exit Advanced Reject Setup

NOTE: This screen requires "Engineer Level" to view.

View "How To" Guides

# "HOW TO" GUIDE

| PRODUCT | USER | I/O | QC |
|---|---|---|---|

**p56** New Product Wizard — E

**p65** Setup New User — Q

**p67** Setup Output Device — E

**p71** Perform Validation Check — Q

**p57** Clone a Product — E

**p66** Switch Users — O

**p68** Setup Input Device — E

**p72** Export Report Logs — Q

**p58** Rename Product — S

**p69** Setup Reject Device — E

**p59** Setup Product Boundary — S

**p70** Setup Remote Support — E

**p60** Change/Run a Product — O

**p61** Edit Product Settings — S

**p73** The Detection Boundary Explained

**p62** Setup Reject Timing — E

**p63** Copy Timer Settings — E

| PASSWORD LEVEL HEIRARCHY |
|---|
| E – Engineer = 4444 |
| S – Supervisor = 3333 |
| Q – Quality Control = 2222 |
| O – Operator = 1111 |
| NOTE: Symbol in upper right corner denotes minimum password level required to view that screen. |

**p64** Perform a Backup — E

USER INTERFACE

# "HOW TO" RUN NEW PRODUCT WIZARD
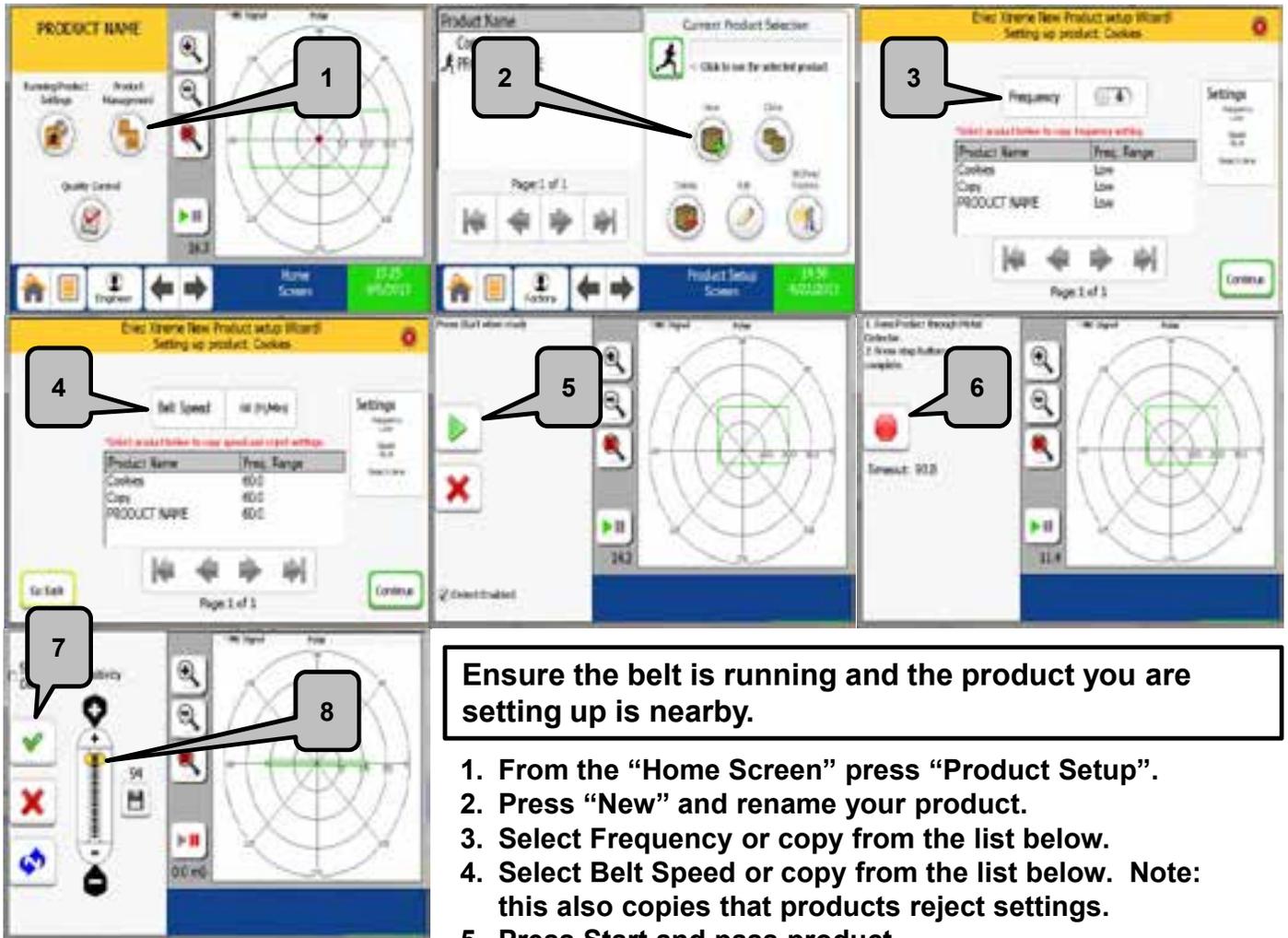


Ensure the belt is running and the product you are setting up is nearby.

1. From the "Home Screen" press "Product Setup".
2. Press "New" and rename your product.
3. Select Frequency or copy from the list below.
4. Select Belt Speed or copy from the list below. Note: this also copies that products reject settings.
5. Press Start and pass product.
6. Press Stop after product has passed through the tunnel.
7. If the settings are acceptable select the "Green Check Box". If you wish to be more aggressive or conservative with the sensitivities see step 8.
8. The sensitivity slider is set to 94 as the default. In the vast majority of cases no adjustment is necessary to achieve desired sensitivity levels. The sensitivity slider increases to a maximum of 100 and a minimum of 0.

NOTE: The disk icon under the sensitivity level allows you to save the current setting as the sensitivity default should the need arise.

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USER INTERFACE

# "HOW TO" CLONE A PRODUCT
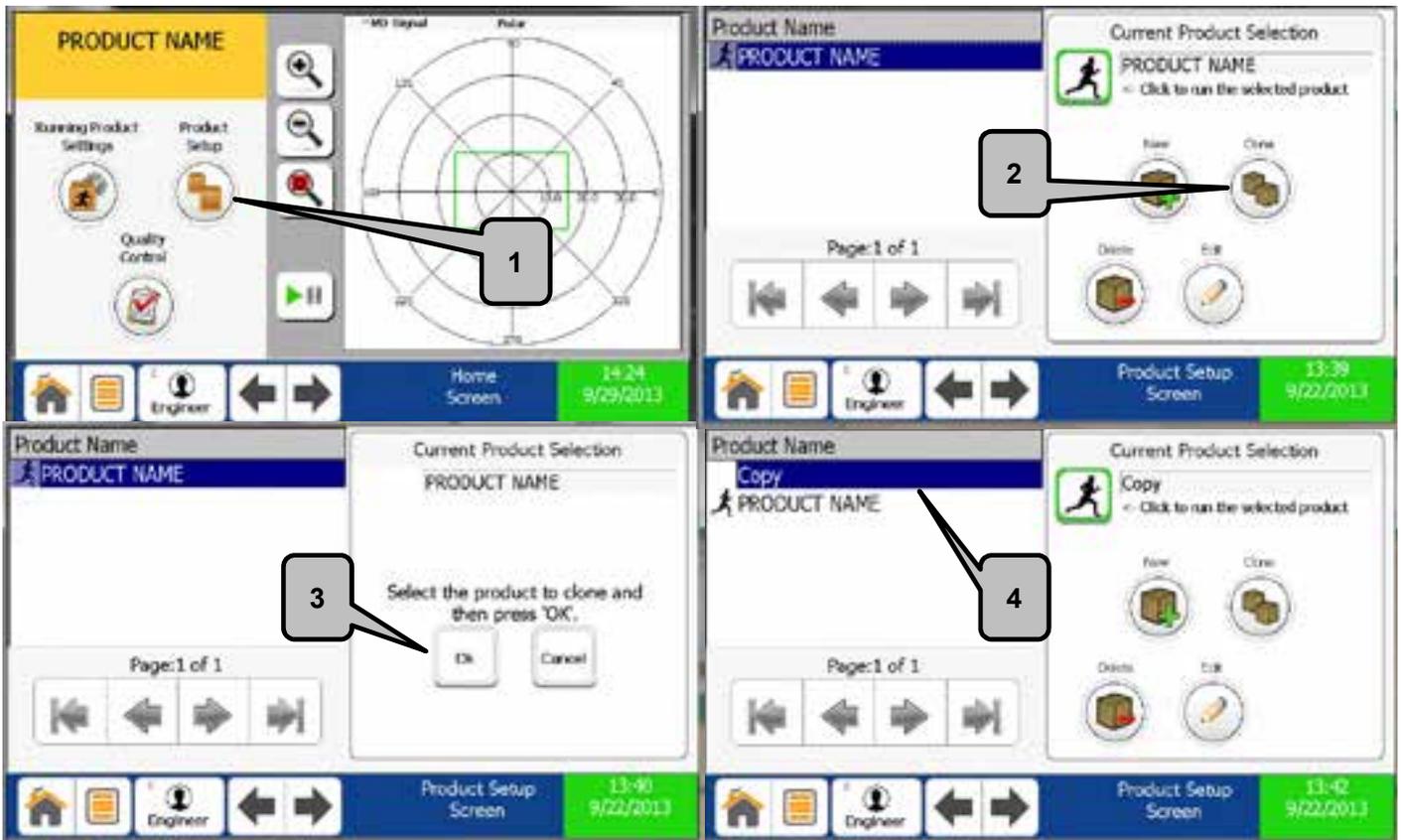


1. From the Home Screen press "Product Setup".
2. Press Clone.
3. Select Product from the list on the left to clone. Once selected it will be visible under "Current Product Selection". Press "OK".
4. Rename your new product and it will display in the Product Name list. (See "How To" Rename a Product on the following page)

# "HOW TO" RENAME A PRODUCT
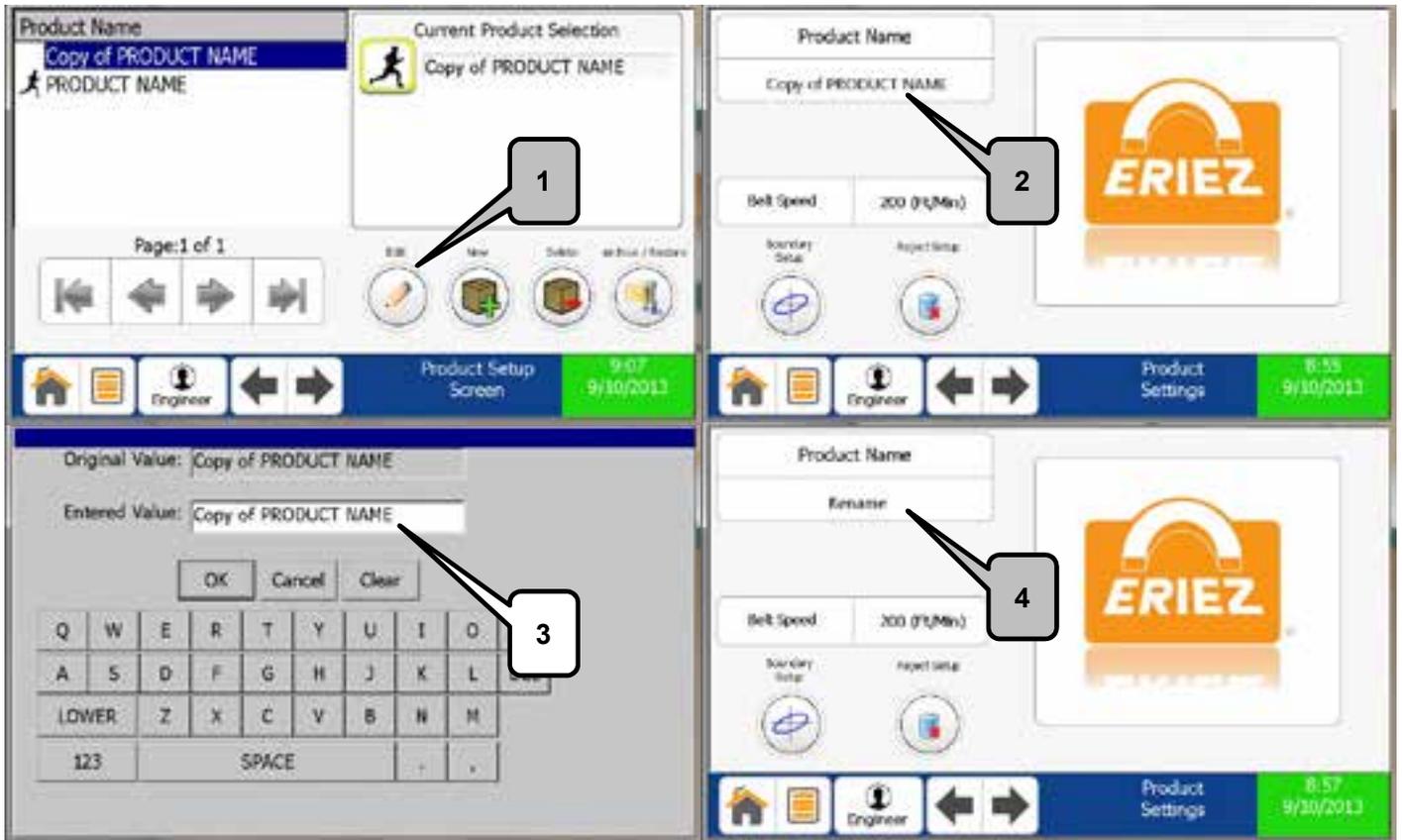


1. From the "Product Setup" Screen select the product you wish to edit and press "Edit".
2. Press the box below Product Name to rename the product.
3. Rename the product using the keyboard and press "OK".
4. The new product name will display under Product Name.

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Guides
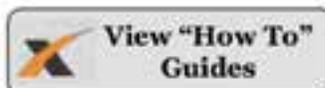
# "HOW TO" SETUP A PRODUCT BOUNDARY
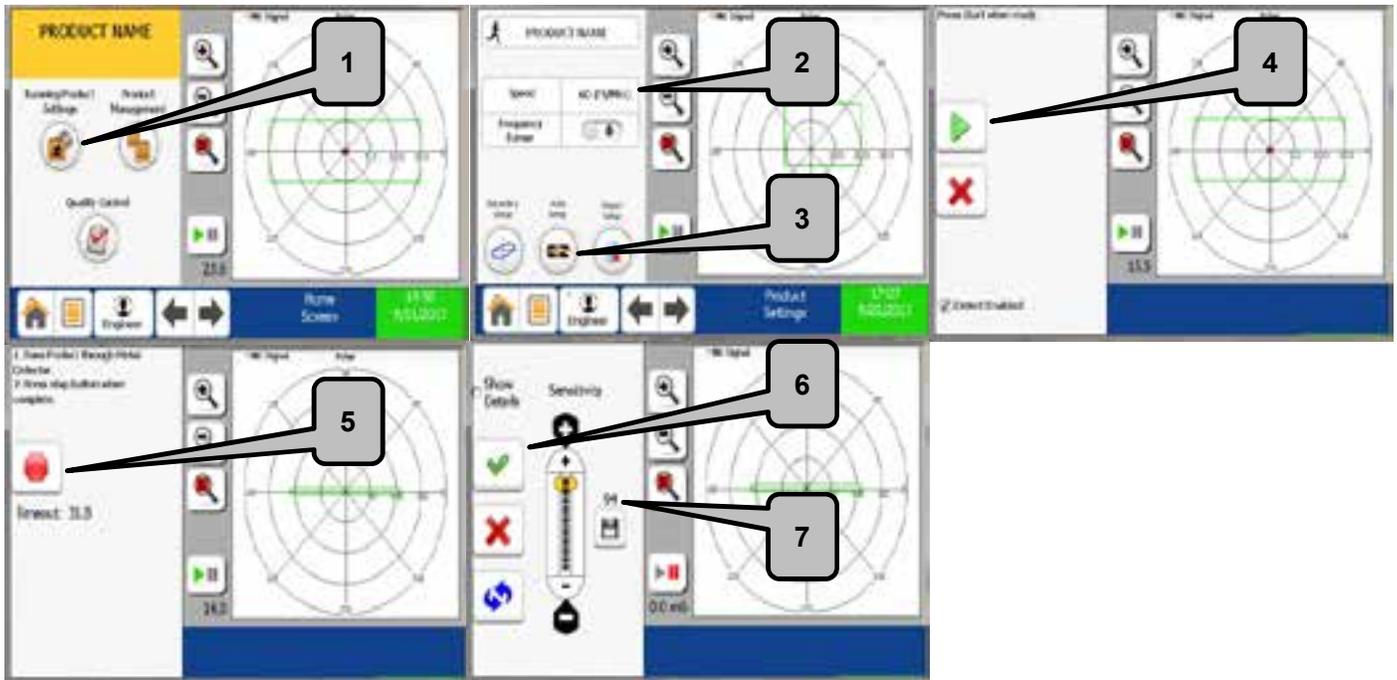


Ensure the belt is running and the product you are setting up is nearby.

1. From the "Home Screen" select "Running Product Settings".
2. Edits belt speed. Ensure this parameter matches the physical belt speed. A tachometer is recommended to get an accurate reading.
3. Press the "EZ" button.
4. Press the "Start Button"
5. Pass the product through the aperture and press the "Stop" button.
6. If the settings are acceptable select the "Green Check Box". If you wish to be more aggressive or conservative with the sensitivities see step 7.
7. The sensitivity slider is set to 94 as the default. In the vast majority of cases no adjustment is necessary to achieve desired sensitivity levels. The sensitivity slider increases to a maximum of 100 and a minimum of 0.

NOTE: The disk icon under the sensitivity level allows you to save the current setting as the sensitivity default should the need arise.

# "HOW TO" CHANGE/RUN A PRODUCT



1. From the "Product Setup" Screen select the product you wish to run.
2. Press the "Running Man" button.
3. The Home Screen will now be displayed with the new running product.

# "HOW TO" EDIT PRODUCT SETTINGS
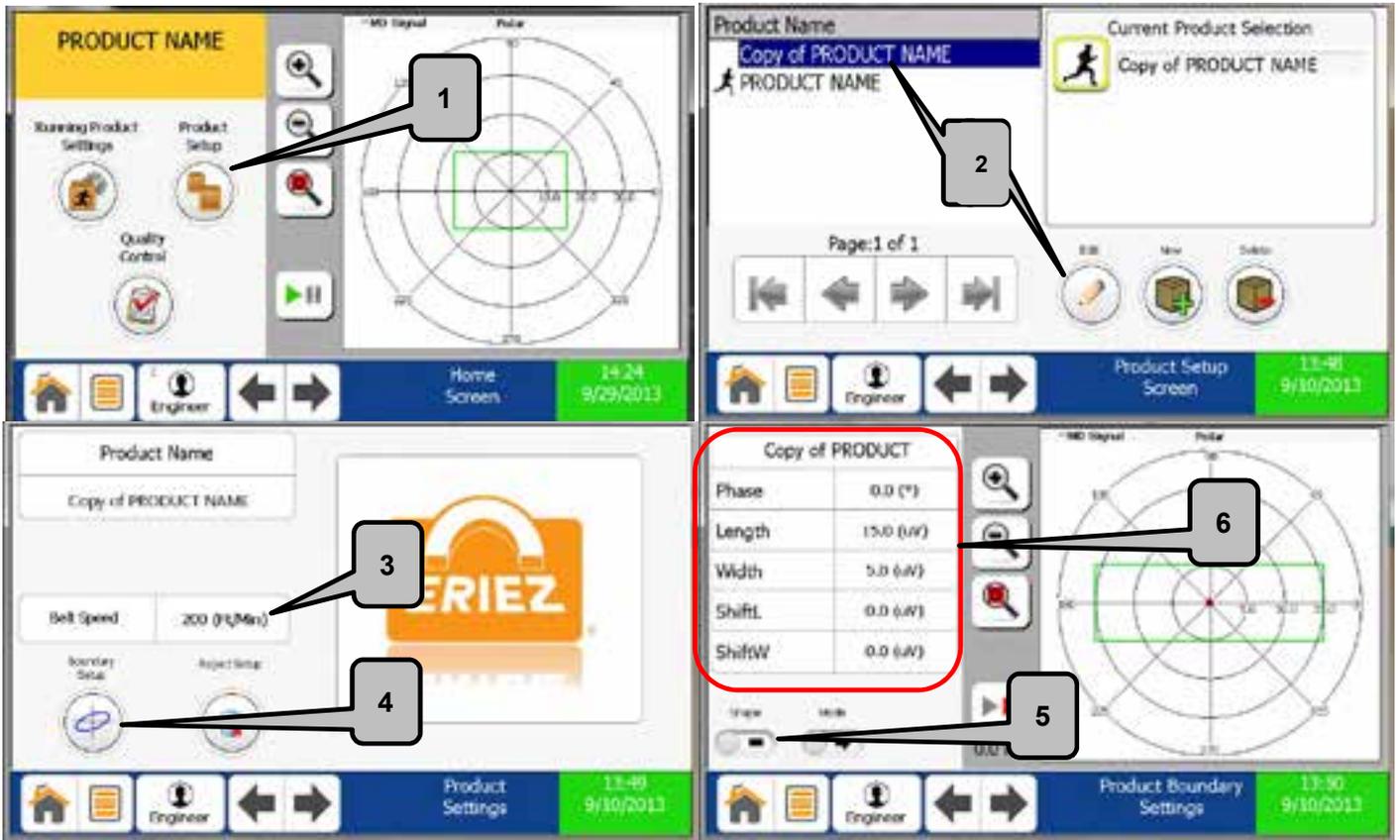


1. Select "Product Setup".
2. Select product you wish to edit and press the "Edit" button.
3. Edits belt speed.  Ensure this parameter matches the physical belt speed.  A tachometer is recommended to get an accurate reading.
4. Select "Boundary Setup".
5. Press to toggle between the rectangle boundary and the ellipse.
6. Press desired parameter value to alter the "boundary" shown by the green rectangle.

# "HOW TO" SETUP REJECT TIMING
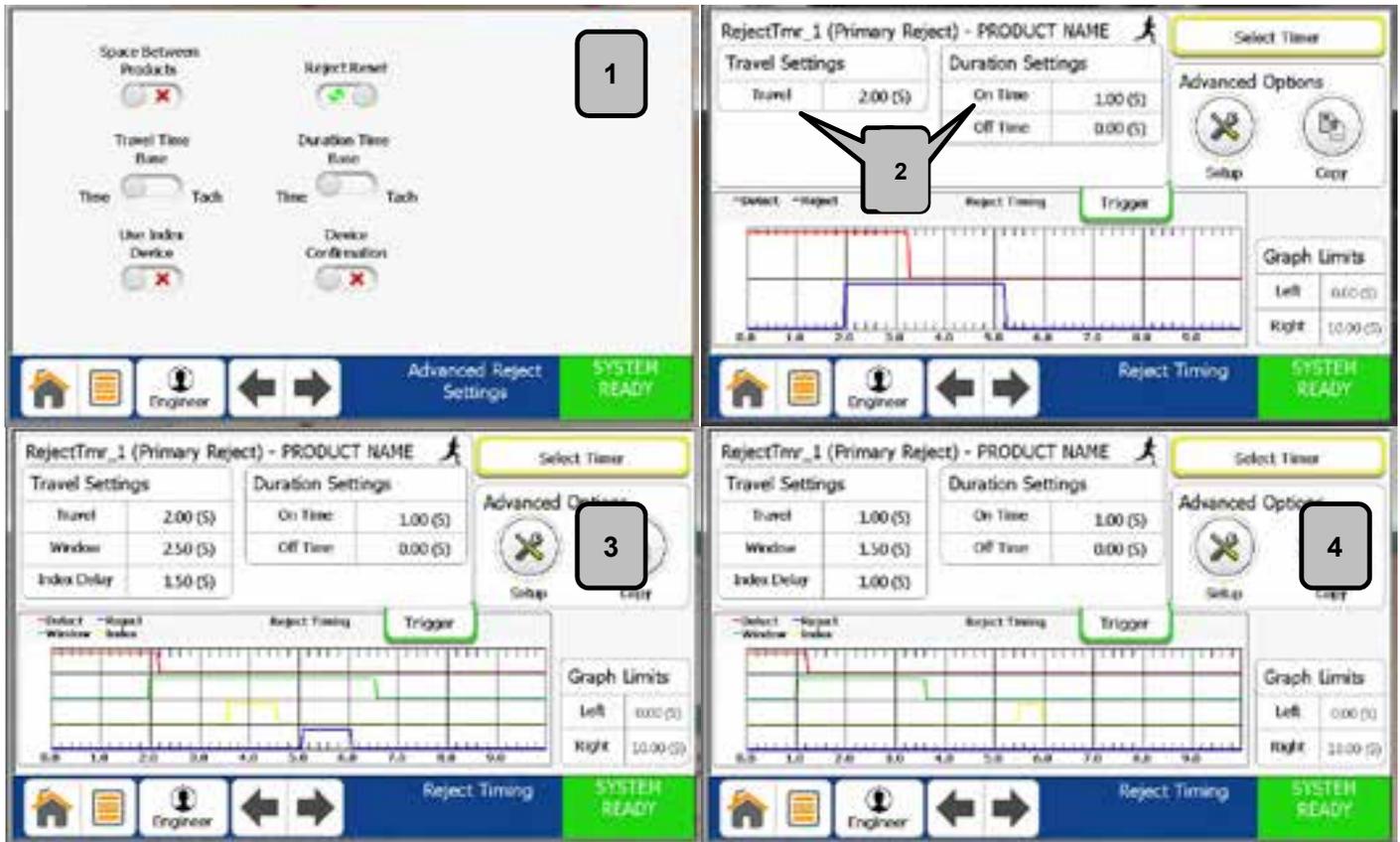


1. From the "Advanced Reject Settings Screen" make the appropriate selections based on your product. Note that not all options may be available depending on the inputs and outputs that have been setup.
2. In this example an index device(i.e. photo eye) is NOT being used. Set the desired "Travel" and "On Time". The reject device on time(blue) will always be greater than or equal to the detect time(red) regardless of the "On Time" setting. Examples of use would be a stop belt or air blast.
3. In this example an index device(i.e. photo eye) IS being used CORRECTLY. Set the desired "Travel" and "On Time". "Off Time" is usually reserved for Pusher Arm devices. The "Window"(green) opens at the end of the "Travel Time". The index device(yellow) has to fire within this window. The index delay is used to delay the reject from firing until it has passed the index device and is ready to be rejected.
4. In this example an index device(i.e. photo eye) IS being used INCORRECTLY. The index device(yellow) did not fire within the window(green). Thus the reject device did not fire.

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USER INTERFACE

# "HOW TO" COPY TIMER SETTINGS
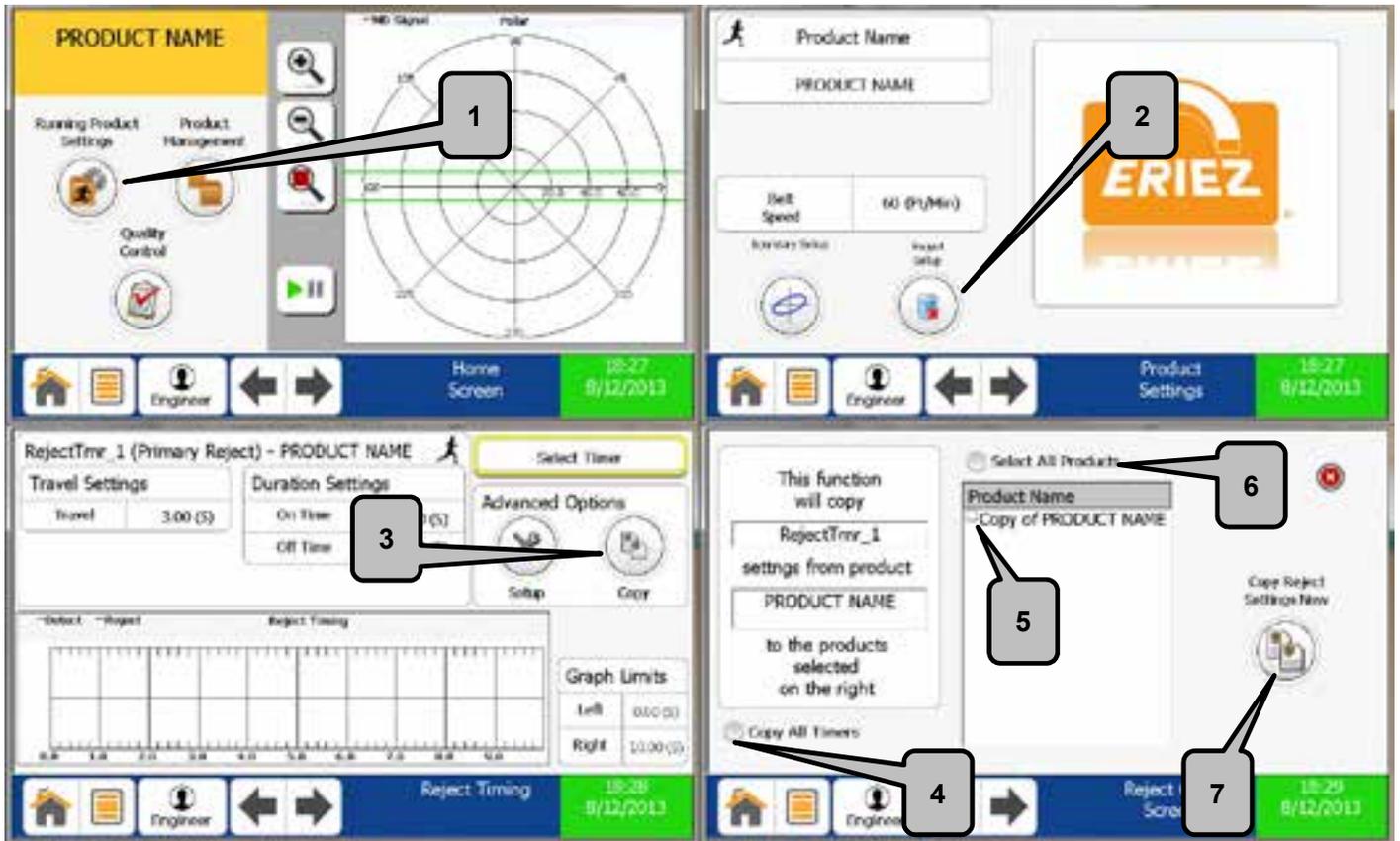


Ensure you have selected and are "running" the product you wish to copy the timer from.

1. From the "Home Screen" select "Running Product Settings".
2. Select "Reject Setup" and pick the timer you wish to copy.
3. Select "Copy" from the Advanced Options.
4. Press this option if you wish to copy all timers associated with this product.
5. Select product you wish to copy timer to.
6. Press this option if you wish to copy to all products.
7. Press "Copy Reject Settings Now" to initiate.

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# "HOW TO" PERFORM A BACKUP



1. From the "Home Screen" press "Product Setup".
2. Press "Backup Restore".
3. Select Backup and press "OK"
4. Select appropriate drive to backup to. If using a "USB Stick" select "External Drive".
5. Press "OK".
6. "System Backup Complete" will display when finished. Press "OK".

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# "HOW TO" SETUP A NEW USER
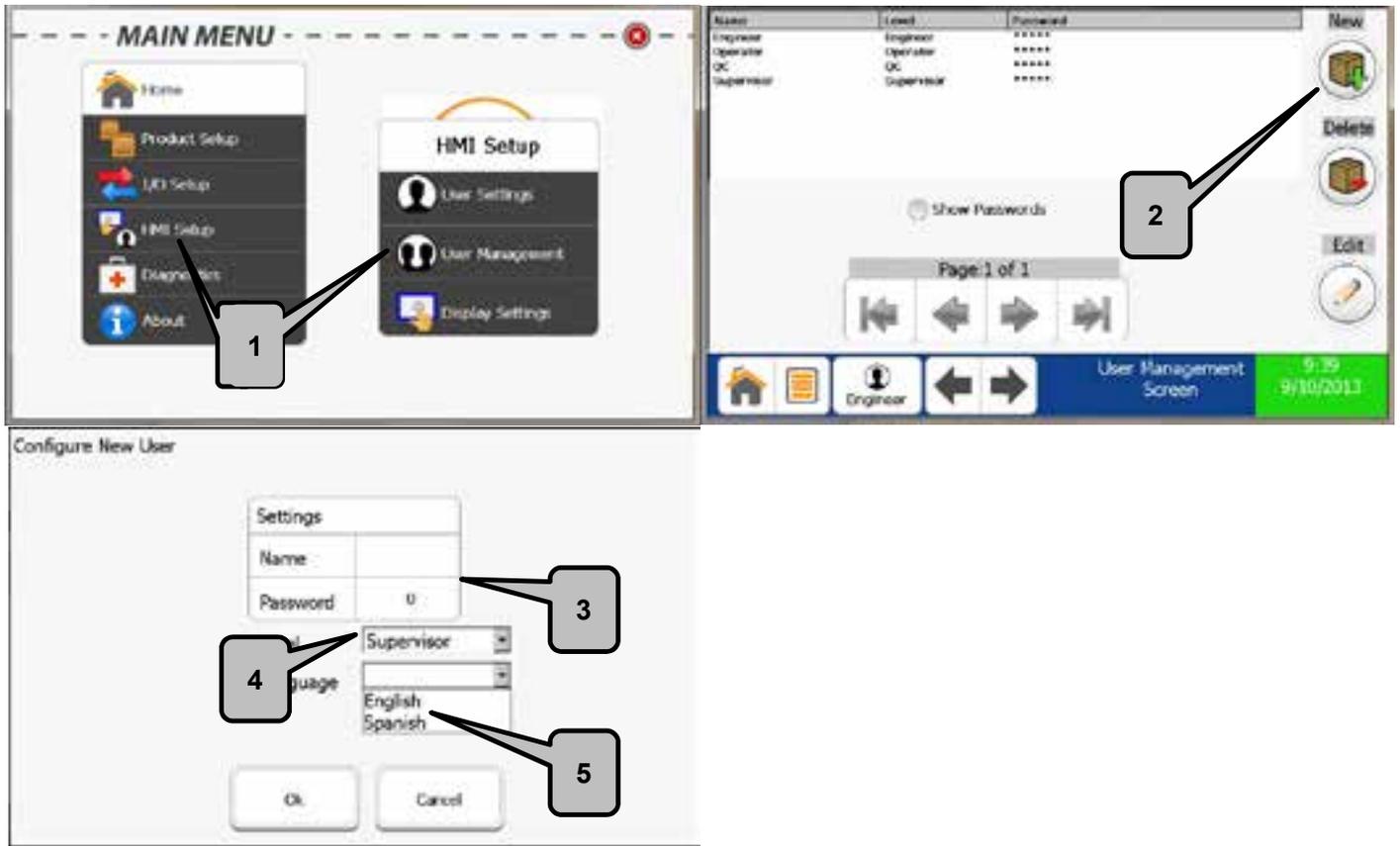


1. **From the "Main Menu" select "HMI Setup" then "User Management".**
2. **Press the "New" button.**
3. **Input the new user's name and select a password.**
4. **Select the user login level from the dropdown.**
5. **Select the user language from the dropdown and press "OK".**

# "HOW TO" SWITCH USERS
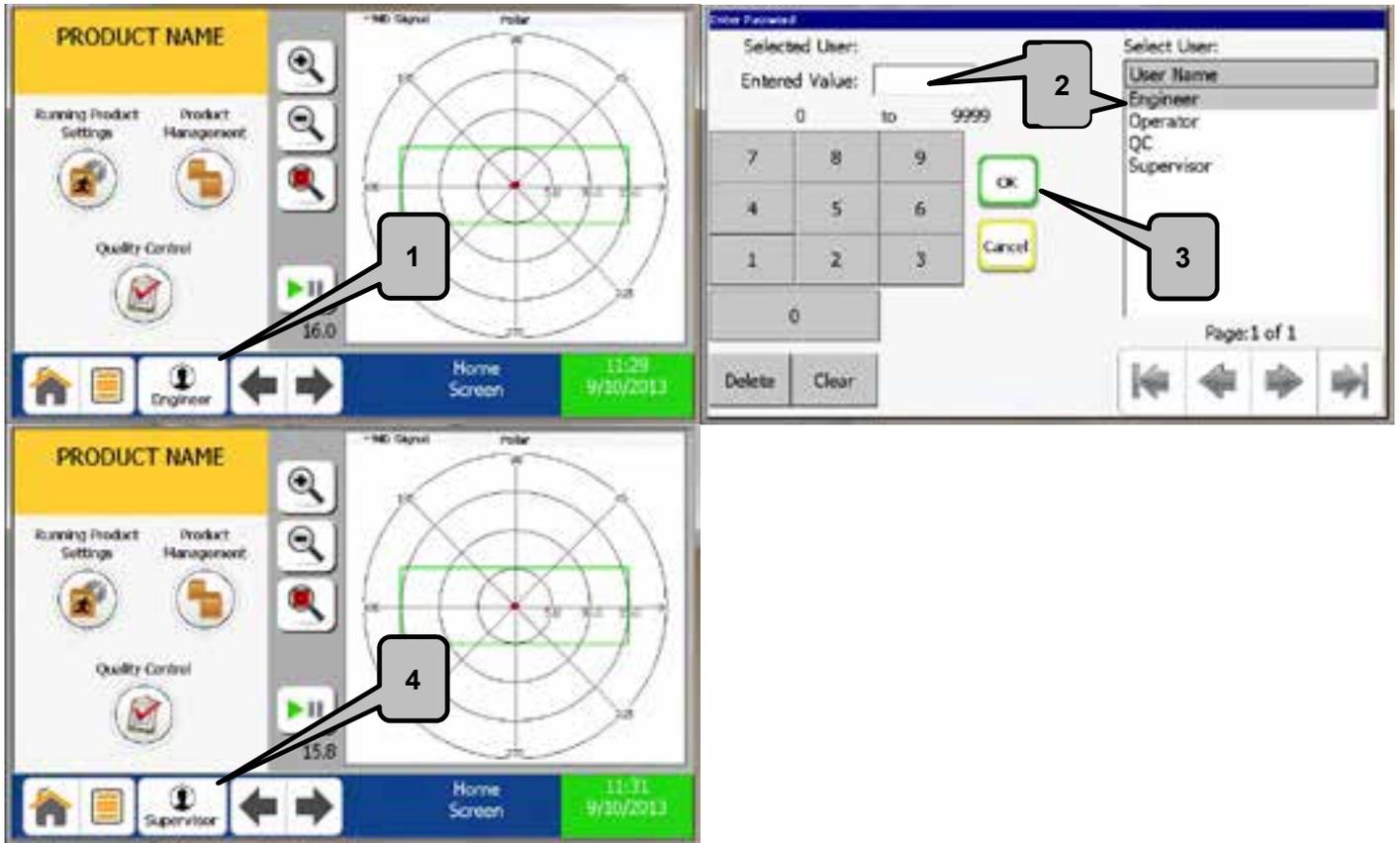


1. From the Task Bar press the User Login button.
2. Select the User Name from the List and enter the password.
3. Press "OK".
4. Verify User Login Name appears on User Login button.
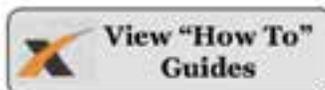
# "HOW TO" SETUP AN OUTPUT DEVICE
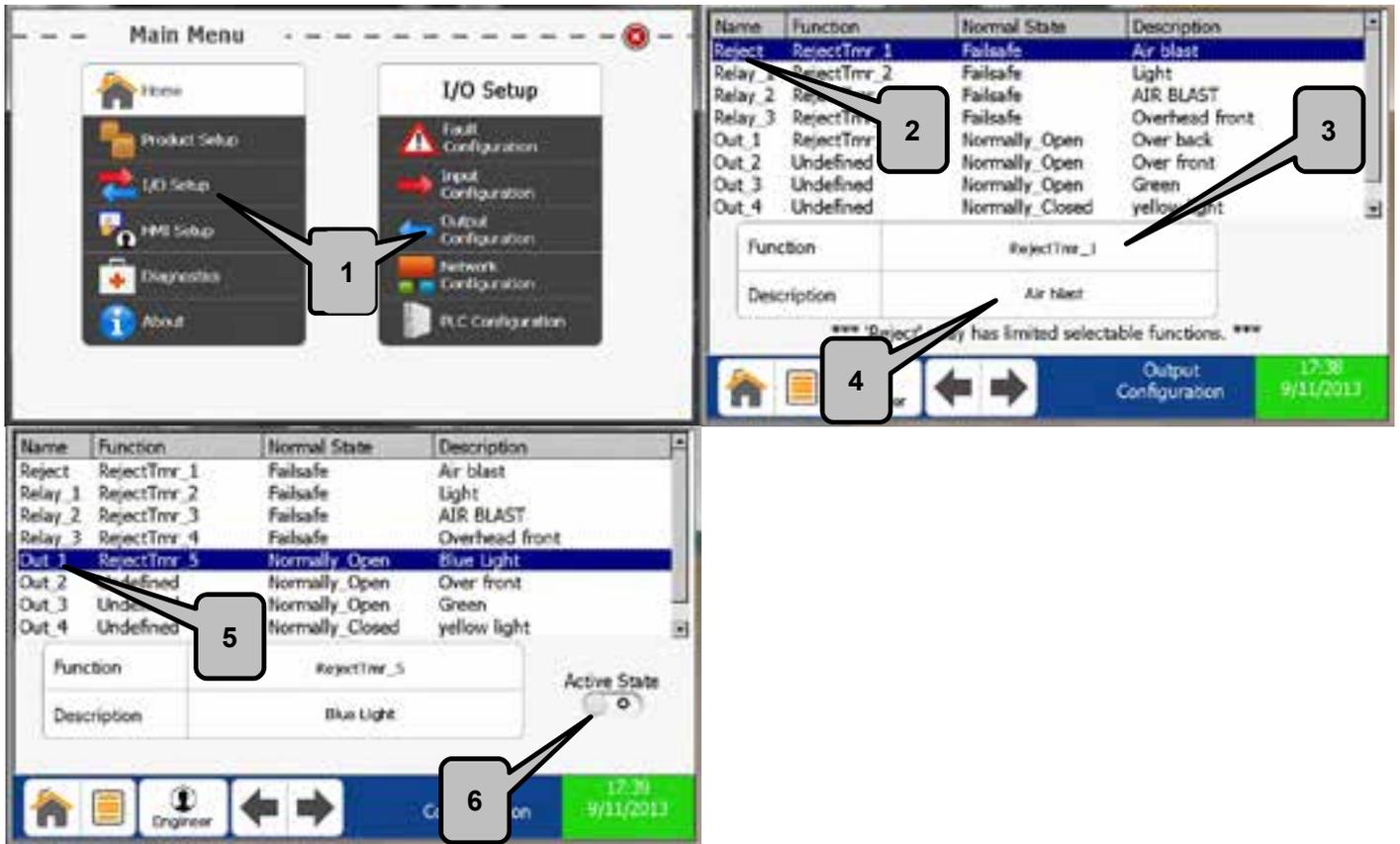


1. From the "Main Menu" select "I/O Setup" then "Output Configuration".
2. Select the output that the "output device" is wired to.
3. Select output device function. The "Reject" output has limited functionality and is the primary reject output. Reject and Relay 1-3 are failsafe wired.
4. Enter a description for the output device.
5. Out 1-5 are solid state relays and are not failsafe.
6. Select the active state (Normally Open/Normally Closed) when using Out 1-5.

USER INTERFACE

# "HOW TO" SETUP AN INPUT DEVICE
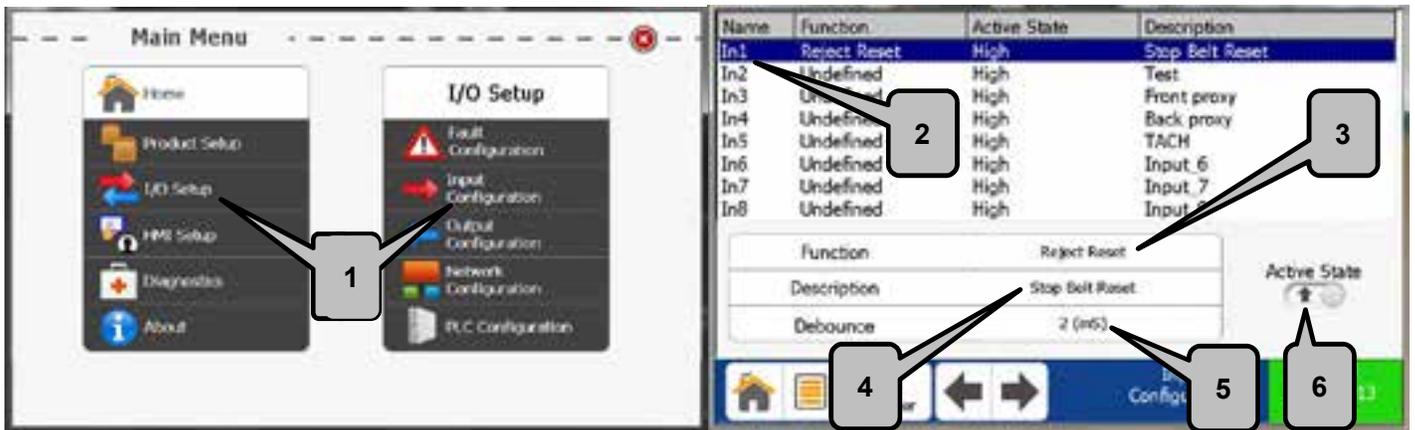


1. From the "Main Menu" select "I/O Setup" then "Input Configuration".
2. Select the input that the "input device" is wired to.
3. Select the device function (i.e. tachometer, overhead, etc..).
4. Enter a description for the input device.
5. Set the debounce.  In the vast majority of cases the 2 ms default is sufficient.
6. Select "Active State" for input device. High = 10-30V  Low = 0-0.9V

# "HOW TO" SETUP A REJECT DEVICE

1.  Ensure reject device and all associated devices(i.e. photo eye, tachometer, etc…) are wired into the control.  See Electrical Installation Tab.
2.  Configure Input and Output Devices.
3.  Configure "Advanced Reject Settings" page.
4.  Setup reject timing.

USER INTERFACE

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# "HOW TO" SETUP REMOTE SUPPORT

**1. Connect "Secure Gateway" (Purchased Separately) and Metal Detector to your Intranet/LAN as seen below. (ensure outbound port 5721 on your firewall is open)**



**SECURE GATEWAY**

**INTRANET/LAN**　　　**FIREWALL**　　　**INTERNET**
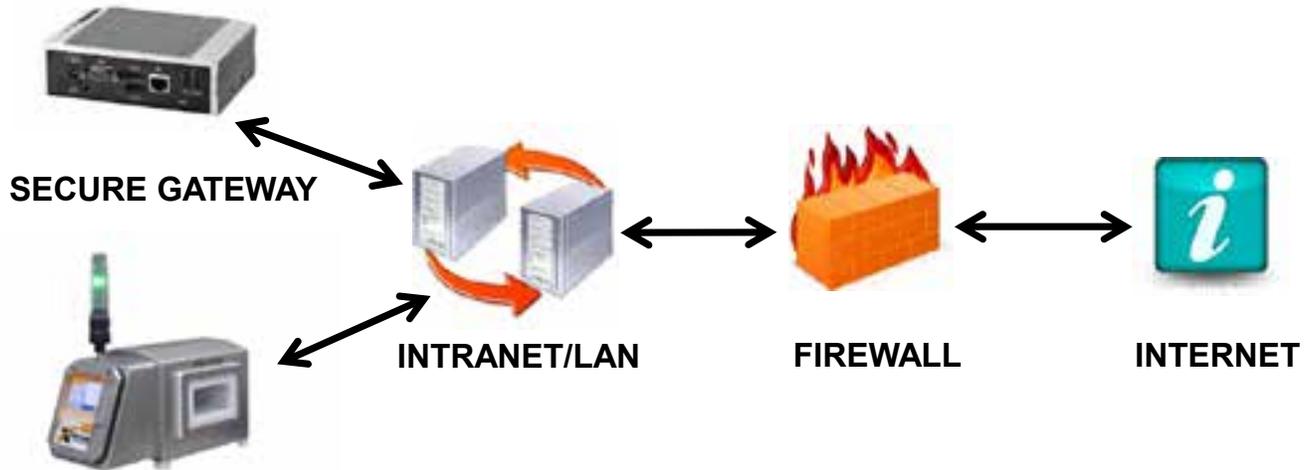
**METAL DETECTOR**

**2. Configure network settings on the metal detector by following the steps below.**
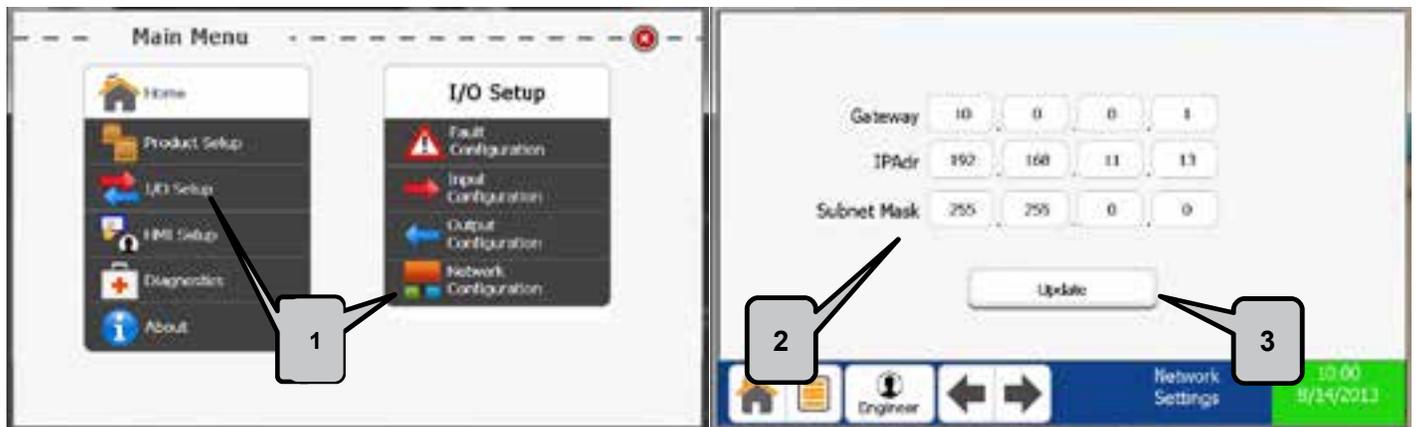


1. From the "Main Menu" select "I/O Setup" then "Network Configuration".
2. Enter the Gateway, a static IP Address, and the Subnet Mask.
3. Press Update for changes to take effect.


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# "HOW TO" PERFORM A VALIDATION CHECK



1. On the task bar press "Validation Needed".
2. Press the metal type you wish to test.
3. Pass the listed metal through the aperture and press the "Stop" button.
4. Select Pass, Fail, or Retry and repeat the process if necessary for the other metals.
5. Press "Validation Complete" when all metals have been tested.

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# "HOW TO" EXPORT REPORT LOGS



1. Ensure a USB drive is inserted into the USB connector.
2. From the "Home Screen" select "Quality Control".
3. Select which Log you would like to view and export.
4. Press export. You now have the option to rename the file.  Press "OK" after the "Done exporting Log" window pops up.

# THE DETECTION BOUNDARY EXPLAINED



1. **Phase adjustment(degrees). Should align with product signal.**
2. **Length adjustment(uV). Should run parallel to product signal length.**
3. **Width adjustment(uV). Should run parallel to product signal width.**
4. **Shift about the length axis in parallel with selected phase.**
5. **Shift about the width axis in perpendicular with selected phase.**
6. **Detection Boundary shape selection. Default is the rectangle.**

**Rectangle**

**Ellipse**



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USER INTERFACE

# ETHERNET IP INTERFACE
# BETWEEN XTREME METAL DETECTOR AND PLC

## *PLC INTERFACE*

A PLC can be connected to the Xtreme metal detector by means of the factory installed PLC Interface Module. This module allows the PLC to set and retrieve the running product number. It can also retrieve metal detector status information.

```
┌─────────────────┐        Ethernet        ┌─────────────────┐
│  Metal Detector │                         │       PLC       │
│   10.10.10.10   │ ◄─────────────────────► │   10.10.10.9    │
└─────────────────┘                         └─────────────────┘
```
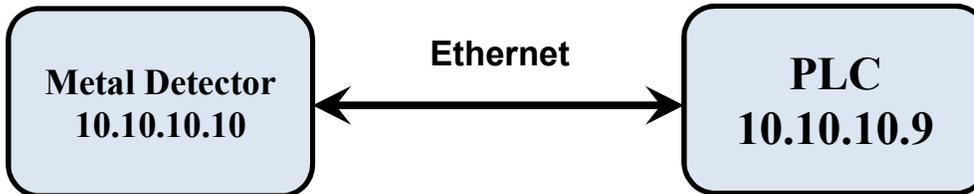
**METAL DETECTOR COMMUNICATION SETUP**

1. From the metal detector "Main Menu" select "I/O Setup" then select PLC Configuration.

2. Verify that the 'IModule' status light is green. If it is red, contact the factory.

| Num | Product Name |
|-----|--------------|
| 1   | Apples       |
| 2   | Bananas      |
| 0   | Cherries     |
| 3   | Mangos       |
| 0   | Oranges      |

Page:1 of 1

IPAdr: 10 . 10 . 10 . 10
Subnet Mask: 255 . 255 . 255 . 0
Gateway: 0 . 0 . 0 . 0

Update

Status: IModule  PLC

PLC Configuration   17:46  12/13/2013
Engineer

PLC INTERFACE
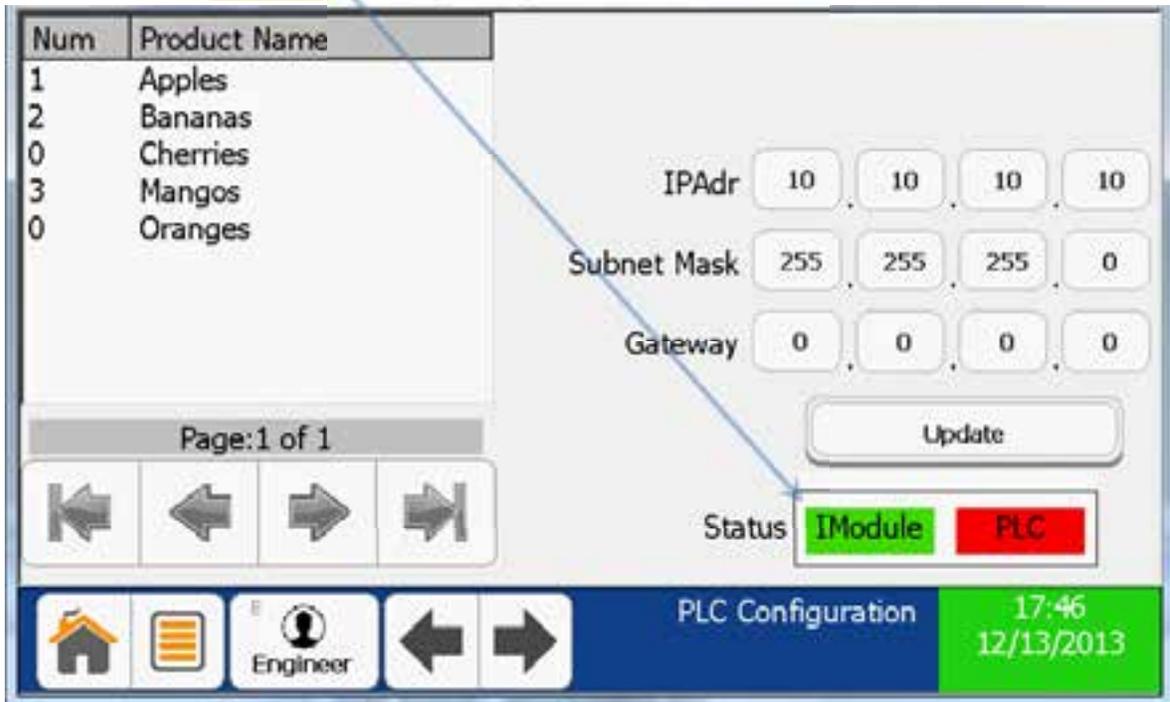
3. Assign product numbers (1, 2, 3 …) to all products that will be remotely selected from the PLC. Assigning 0 to any product makes it un-selectable by the PLC.
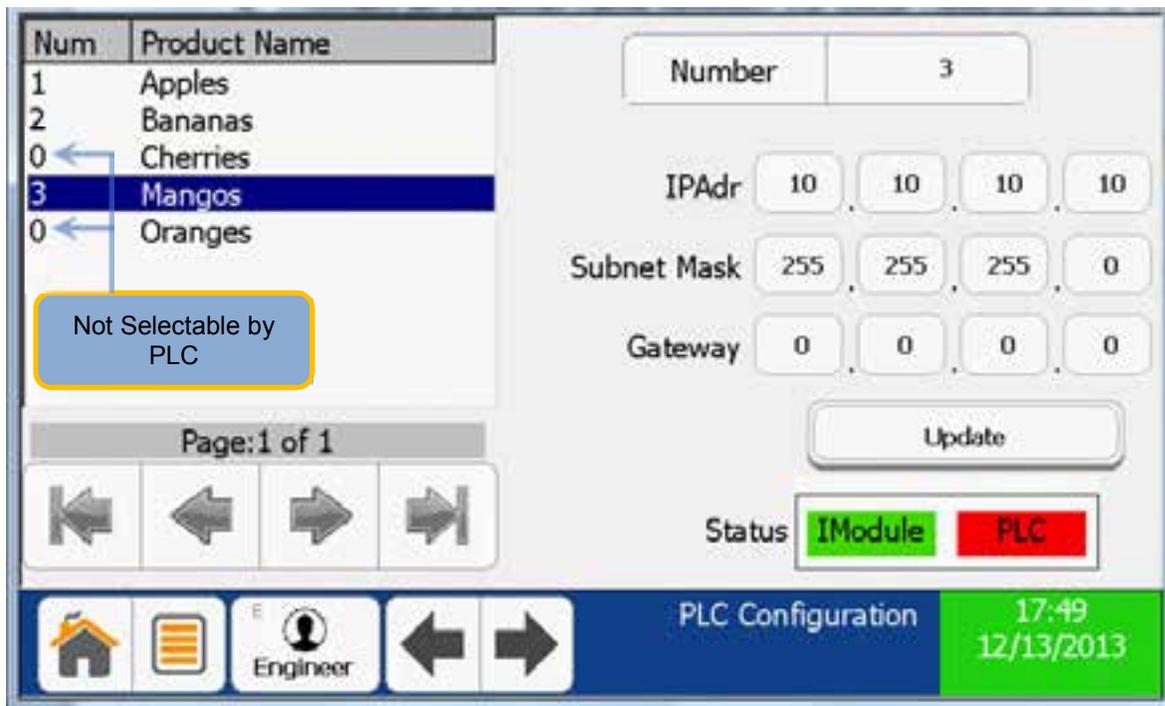


4. Connect an Ethernet cable between the Metal Detector and the desired network. The "red" cat5 cable in the metal detector is for the PLC connection while the "blue" is for remote support (if installed).

# PLC COMMUNICATION SETUP

1. In the Controller Organizer window, under I/O Configuration, right click on your controller Ethernet Port LocalENB. Select Properties, select the General Tab, and assign the PLC Ethernet IP Address,(such as 10.10.10.9)
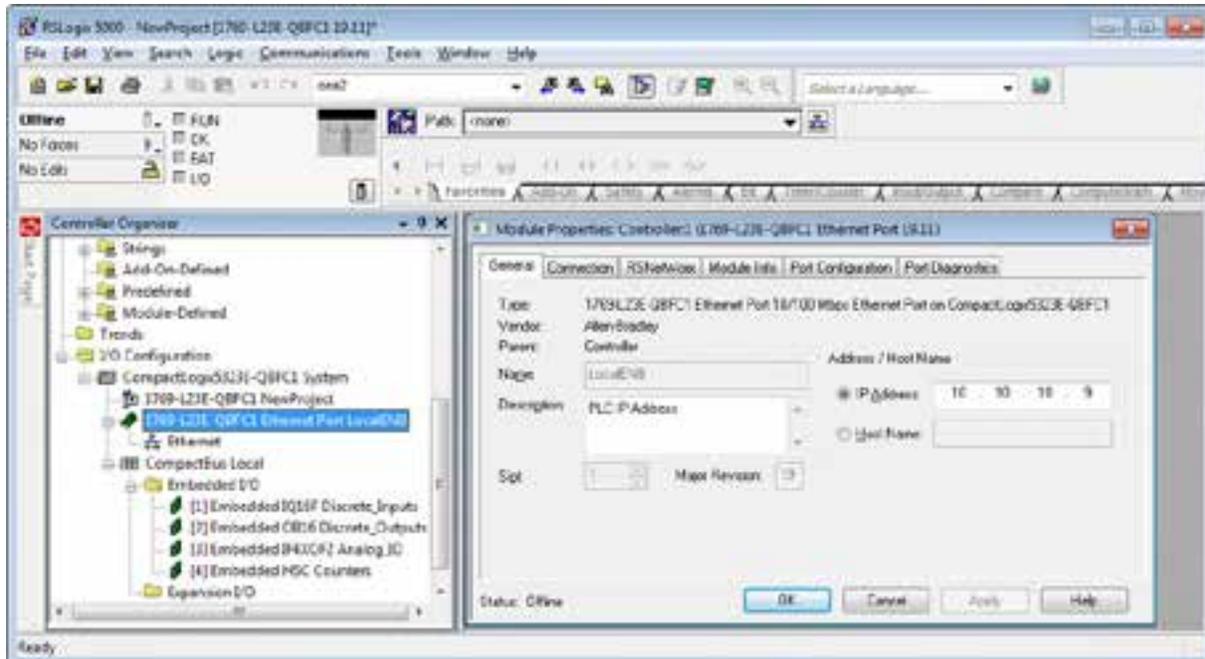


2. In the Controller Organizer window, under I/O Configuration, under your controller, right click on "Ethernet", select New Module.
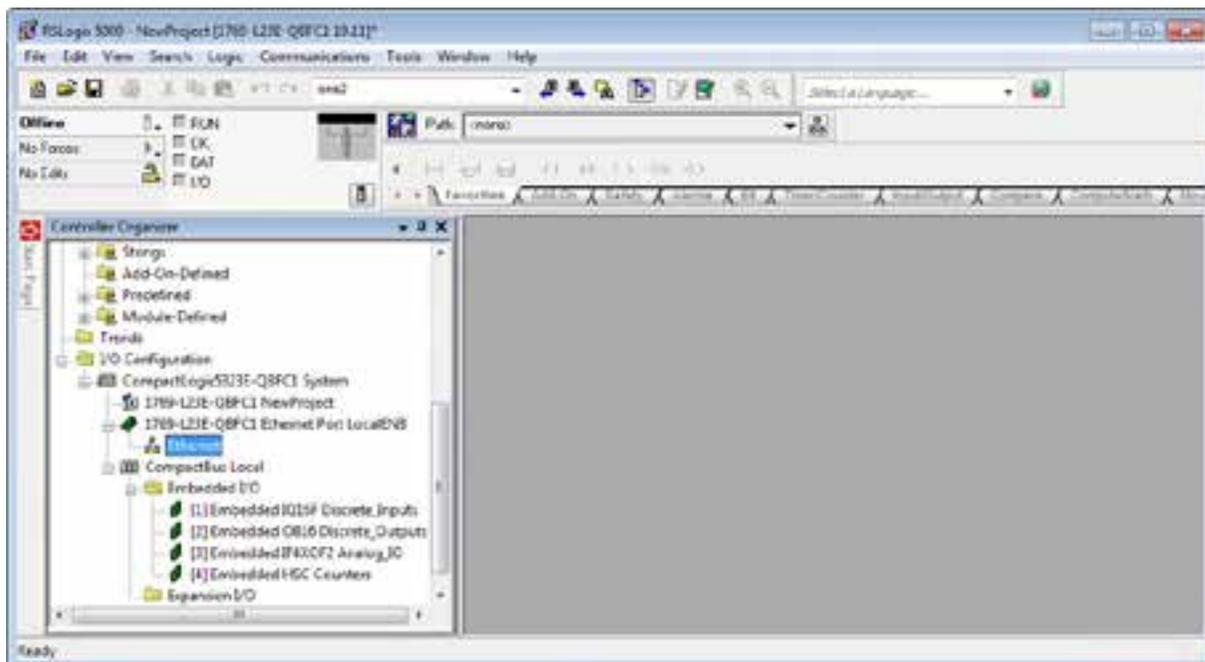
3. From the Select Module dialog box expand Communications and select "Generic Ethernet-Module". Press "OK".
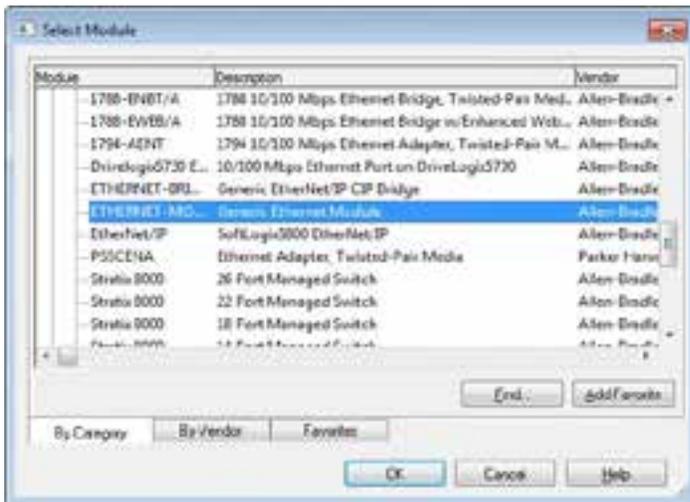


4. On the New Module Properties Page (General tab):
   a. Assign a unique Name (such as EzMD)
   b. Assign the Metal Detector IP Address (such as 10.10.10.10). Please note that this must match the address set on the PLC Configuration page of the metal detector.
   c. Set Assembly Instance Input to 101 and Size to 6.
   d. Set Assembly Instance Output to 110 and Size to 6.
   e. Set Assembly Instance Configuration to 148 and Size to 0.
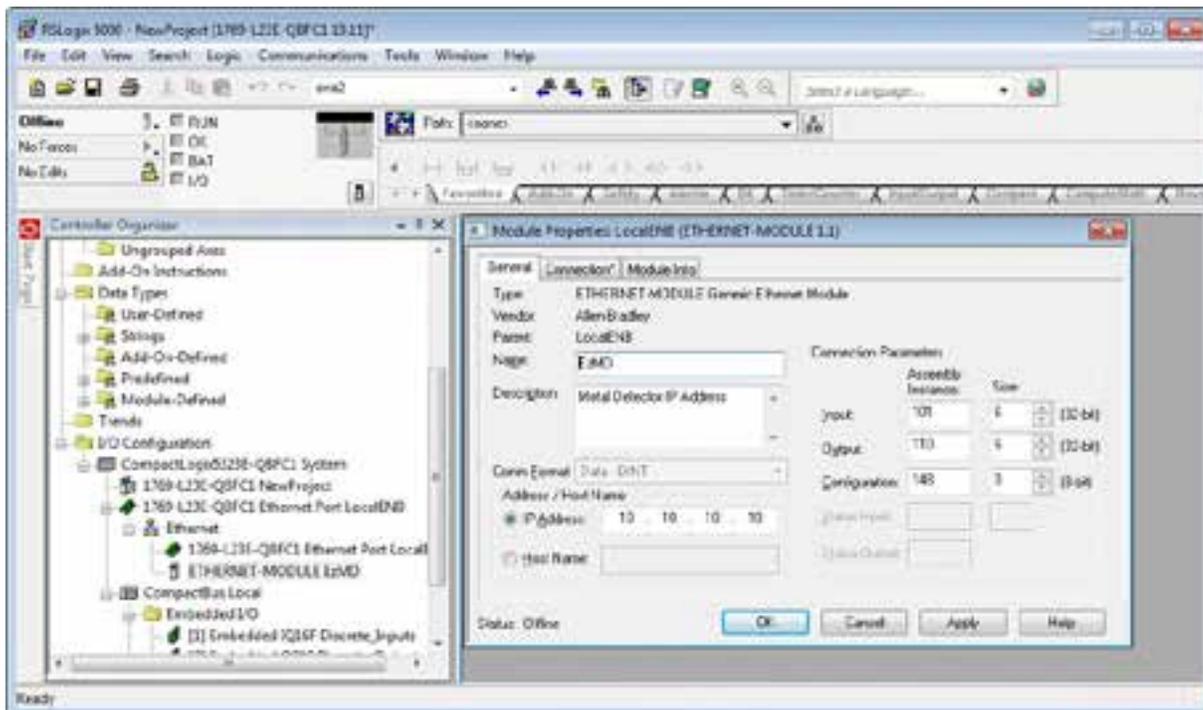
5. From the "Module Properties: LocalENB" select the Connection Tab.
   a. Set the "Requested Pack Interval" (RPI) to 250 mS.
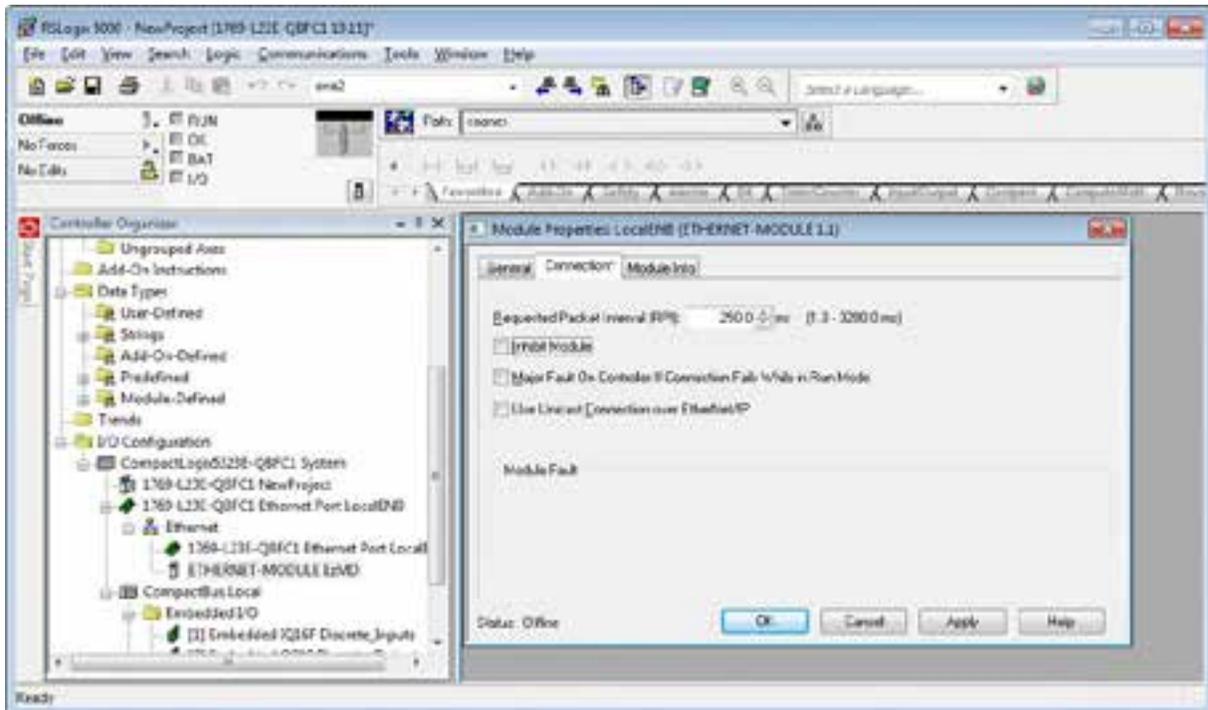


6. Connect the PLC Ethernet cable to the same network as the metal detector.

7. On the metal detector PLC configuration screen, verify both the PLC' and 'IModule' status lights are green.
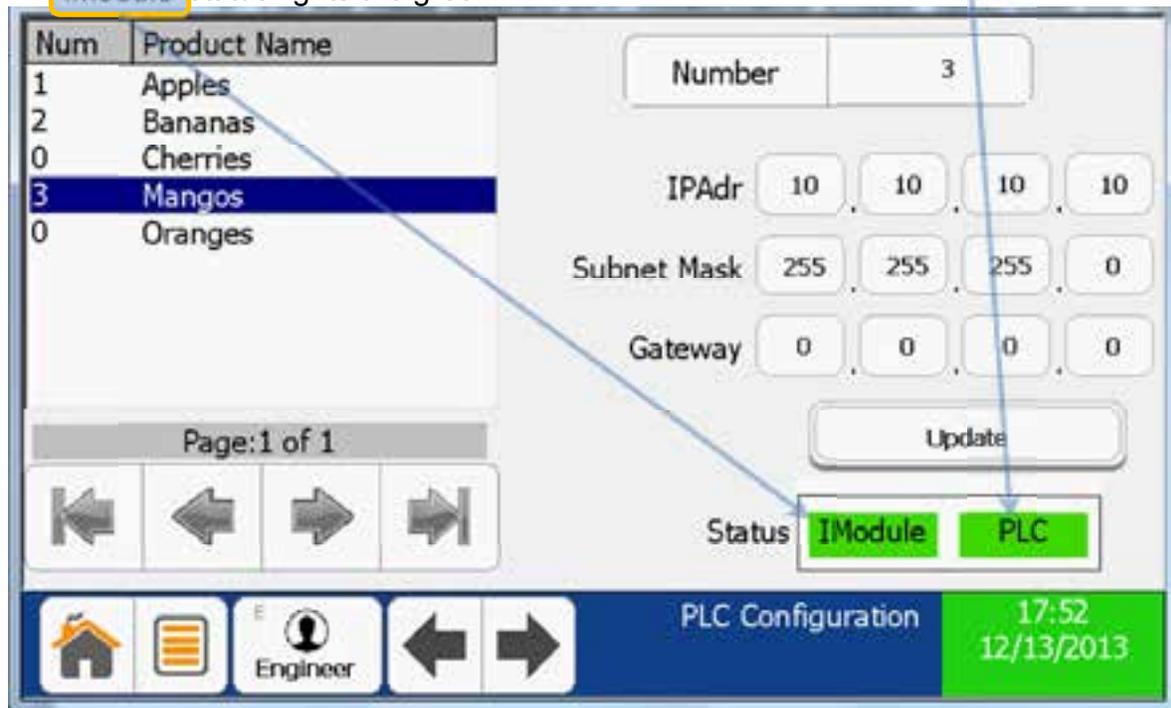
# PLC PROGRAMMING

1. The PLC communicates with the Metal Detector using two 6-word blocks of memory in the Generic Ethernet Module. Each word is 16 bits.

| EzMD:O. | PLC output | EzMD:I. | PLC input |
|---|---|---|---|
| **Data[0]** | reserved | **Data[0]** | metal detector status |
| **Data[1]** | command | **Data[1]** | command confirmation |
| **Data[2]** | param 1 to send | **Data[2]** | received param 1 |
| **Data[3]** | param 2 to send | **Data[3]** | received param 2 |
| **Data[4]** | param 3 to send | **Data[4]** | received param 3 |
| **Data[5]** | reserved | **Data[5]** | metal detector  heartbeat |

2. The PLC initiates all communication with the Metal Detector by **first** filling in the necessary output (send) parameters, **then** writing (a command) to EzMD:O.Data[1].

3. When the Metal Detector responds with the same command and any associated input (receive) parameters, the PLC writes a NO-OP command 0xFF to EzMD.O.Data[1] and the Metal Detector responds with 0x00.

4. The following Metal Detector commands are available:

| DECIMAL | HEX | COMMAND |
|---|---|---|
| | | |
| 1 | 0x0001 | **Set Running Product** (for example product 3) <br> MOV 3 to EzMD:O.Data[2] <br> MOV 16#0001 to EzMD:O.Data[1] |
| | Reply | EzMD:I.Data[0] contains Metal Detector status <br> EzMD:I.Data[1] contains command 16#0001 <br> EzMD:I.Data[5] contains Metal Detector heartbeat |
| | | see Sample Program ladder diagram rung 6 |
| | | |
| 2 | 0x0002 | **Read Running Product** <br> MOV 16#0002 to EzMD:O.Data[1] |
| | Reply | EzMD:I.Data[0] contains Metal Detector status <br> EzMD:I.Data[1] contains command 16#0002 <br> EzMD:I.Data[2] contains **running product number** <br> EzMD:I.Data[5] contains Metal Detector heartbeat |
| | | see Sample Program ladder diagram rung 5 |
| | | |
| 255 | 0x00FF | **No operation** |
| | Reply | EzMD:I.Data[0] contains Metal Detector status <br> EzMD:I.Data[1] contains command 16#0000 <br> EzMD:I.Data[5] contains Metal Detector heartbeat |
| | | see Sample Program ladder diagram rung 8 for automatic no-op insertion |
| | | |

5. Metal Detector status EzMD:I.Data[0] is updated approximately every second and with every command exchange.
   See the sample program rung 0.

| Bit | Description | Value=1 | Value=0 |
| --- | --- | --- | --- |
| 0 | metal detector fault | fault | no fault |
| 1 | metal detector warning | warning | no warning |
| 2 | metal detector ready | ready | not ready |
| 3 | invalid Ethernet command | invalid | valid |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | no reply from metal detector | no reply | reply |

6. The Metal Detector increments a 16-bit counter (heartbeat) and sends it back to the PLC EzMD:I.Data[5] with every status update .
   See the Sample Program ladder diagram rung 1.

# SAMPLE PLC PROGRAM

The sample program assumes one generic Ethernet IP module named EzMD, one 16-bit DC input module named Local:1, and one 16-bit DC output module named Local:2.
Inputs and outputs assigned below.

The Ladder diagram, tags, and rung descriptions can be found on the pages that follow.
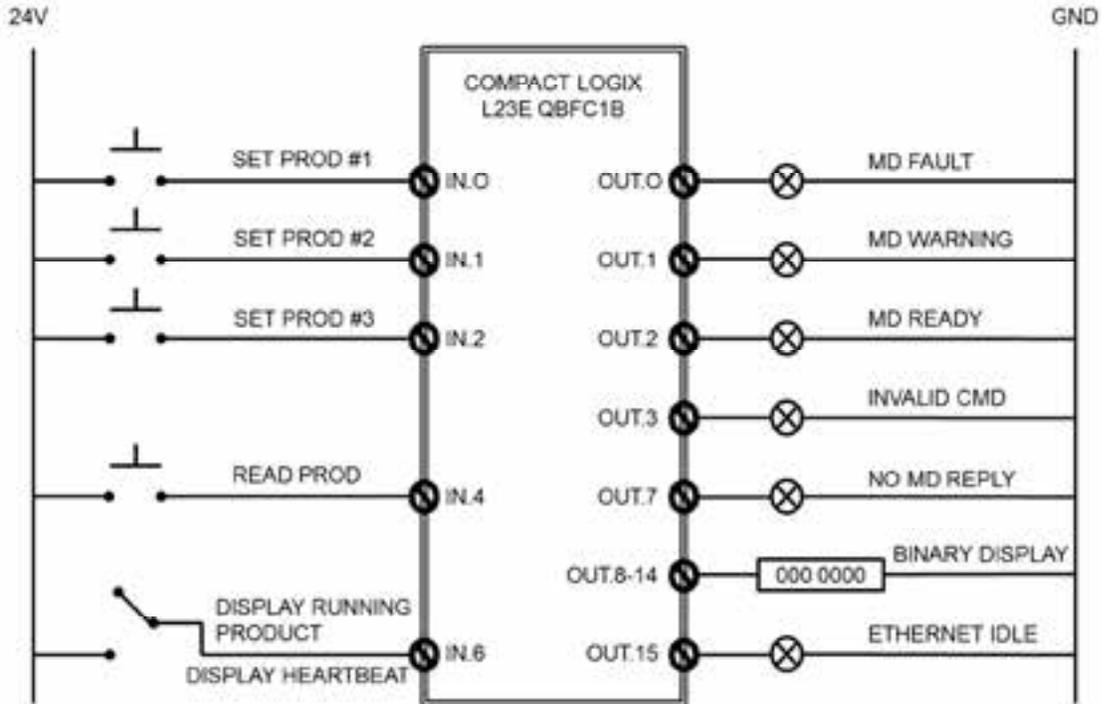


| | DC Inputs<br>Local:I.Data | | DC Outputs<br>Local:O.Data |
|---|---|---|---|
| 0 | SetProduct #1 (momentary 24V) | 0 | MD Fault |
| 1 | Set Product #2 (momentary 24V) | 1 | MD Warning |
| 2 | Set Product #3 (momentary 24V) | 2 | MD Ready |
| 3 | | 3 | MD Invalid Command |
| 4 | Read Running Product  (momentary 24V) | 4 | |
| 5 | | 5 | |
| 6 | Select data to display<br>0V   = Display running product<br>24V  = Display heartbeat | 6 | |
| 7 | | 7 | No Reply from MD |
| | | | |
| 8-14 | | 8-14 | 7-bit Binary display |
| 15 | | 15 | Ethernet Idle |

**MainRoutine - Ladder Diagram**
Eriez_MD_test_ver_19:MainTask:MainProgram
Total number of rungs in routine: 10

**Page 1**
12/13/2013 12:04:02 PM
C:\Eriez\PLC\Sample1_PLC_Program.ACD

**PLC INTERFACE**

**0** — Continuously write MD status to low byte of output port, with MD status bit 15 in output bit 7 position.

```
SWPB
Swap Byte
Source          RxStatus
                <EzMD:I:Data[0]>
                4
Order Mode      WORD
Dest            work1
                1024
```

```
MVM
Masked Move
Source          work1
                1024
Mask            16#0080
Dest            Local:2:O.Data
                2#1000_0010_0000_0100
```

```
MVM
Masked Move
Source          RxStatus
                <EzMD:I:Data[0]>
                4
Mask            16#007F
Dest            Local:2:O.Data
                2#1000_0010_0000_0100
```

**1** — When Display Selector (input bit 6) is 24V, continuously copy 7-bit MD heartbeat bits 0-6 to the output port bits 8-14 for binary display.

Display Heartbeat
Select_6_Display
<Local:1:I.Data.6>

```
MVM
Masked Move
Source          RxHeartbeat
                <EzMD:I:Data[5]>
                2054
Mask            16#7F00
Dest            Local:2:O.Data
                2#1000_0010_0000_0100
```

**2** — When Display Selector (input bit 6) is NOT 24V, continuously copy 7-bit MD Running Product number bits 0-6 to the output port bits 8-14 for binary display.

Display Heartbeat
Select_6_Display
<Local:1:I.Data.6>

```
SWPB
Swap Byte
Source   RunningProduct
                2
Order Mode      WORD
Dest            work2
                512
```

```
MVM
Masked Move
Source          work2
                512
Mask            16#7F00
Dest            Local:2:O.Data
                2#1000_0010_0000_0100
```

**3**

Ethernet_Idle

Ethernet Idle
Local:2:O.Data.15

**4** — If the Tx command is 0xFF and Rx command is 0x00, then turn on Ethernet Idle

```
MEQ
Mask Equal
Source          16#00FF
Mask            16#00FF
Compare         TxCmd
                <EzMD:O:Data[1]>
                255
```

```
MEQ
Mask Equal
Source          16#0000
Mask            16#00FF
Compare         RxCmd
                <EzMD:I:Data[1]>
                0
```

Ethernet_Idle

**5** — If Read Product pushbutton input or the Read Product latch is set, then send Read Product command and clear the Read Product latch
(Set the TxParam1 to 0xEE and write Tx message to CMD1 and CMD2 for debug purposes)

Ethernet_Idle    ReadProdLatch

PB Read Prod
PB_4_ReadProd
<Local:1:I.Data.4>

```
MOV
Move
Source          16#00EE
Dest            TxParam1
                <EzMD:O:Data[2]>
                170
```

```
MOV
Move
Source          16#0002
Dest            TxCmd
                <EzMD:O:Data[1]>
                255
```

```
MOV
Move
Source          TxCmd
                <EzMD:O:Data[1]>
                255
Dest            CMD1
                2
```

```
MOV
Move
Source          TxParam1
                <EzMD:O:Data[2]>
                170
Dest            CMD2
                238
```

ReadProdLatch
(U)

MainRoutine - Ladder Diagram
Eriez_MD_test_ver_19:MainTask:MainProgram
Total number of rungs in routine: 10

Page 2
12/13/2013 12:04:10 PM
C:\Eriez\PLC\Sample1_PLC_Program.ACD

If Set Product 1 or 2 or 3 pushbutton input, send Set Product command and set a latch to then Read back the Product number.
(Write Tx message to CMD1 and CMD2 for debug purposes)

**6**

Ethernet_Idle

PB Set Prod #1
PB_0_SetProd1
<Local:1:I.Data.0>

MOV
Move
Source          16#0001
Dest            TxParam1
                <EzMD:O.Data[2]>
                170

MOV
Move
Source          16#0001
Dest            TxCmd
                <EzMD:O.Data[1]>
                255

PB Set Prod #2
PB_1_SetProd2
<Local:1:I.Data.1>

MOV
Move
Source          16#0002
Dest            TxParam1
                <EzMD:O.Data[2]>
                170

PB Set Prod #3
PB_2_SetProd3
<Local:1:I.Data.2>

MOV
Move
Source          16#0003
Dest            TxParam1
                <EzMD:O.Data[2]>
                170

MOV
Move
Source          TxCmd
                <EzMD:O.Data[1]>
                255
Dest            CMD1
                2

MOV
Move
Source          TxParam1
                <EzMD:O.Data[2]>
                170
Dest            CMD2
                238

ReadProdLatch
(L)

When the Rx command confirmation is Read Product, save the Running Product number

**7**

MEQ
Mask Equal
Source          TxCmd
                <EzMD:O.Data[1]>
                255
Mask            16#00FF
Compare         16#0002

MOV
Move
Source          RxParam1
                <EzMD:I.Data[2]>
                0
Dest   RunningProduct
                2

When the Rx command confirmation equals the Tx command, change the Tx command to 0xFF, no-operation.
(Set TxPAram1 to 0xAA for debug purposes)

**8**

MEQ
Mask Equal
Source          TxCmd
                <EzMD:O.Data[1]>
                255
Mask            16#00FF
Compare         RxCmd
                <EzMD:I.Data[1]>
                0

MOV
Move
Source          16#00AA
Dest            TxParam1
                <EzMD:O.Data[2]>
                170

MOV
Move
Source          16#00FF
Dest            TxCmd
                <EzMD:O.Data[1]>
                255

First time thru, clear the Tx command to 0xFF, no-operation.
(Set the TxParam1 to 0xCC for debug purposes)

**9**

PLC_Running

MOV
Move
Source          16#00CC
Dest            TxParam1
                <EzMD:O.Data[2]>
                170

MOV
Move
Source          16#00FF
Dest            TxCmd
                <EzMD:O.Data[1]>
                255

PLC_Running
(L)

(End)

PLC INTERFACE

| Name | Value | Data Type | Scope |
|---|---|---|---|
| **CMD1** | 2 | DINT | MainProgram |
| Constant | No | | |
| External Access: | Read/Write | | |
| *CMD1 - MainProgram/MainRoutine - *5(MOV), *6(MOV)* | | | |
| | | | |
| **CMD2** | 238 | DINT | MainProgram |
| Constant | No | | |
| External Access: | Read/Write | | |
| *CMD2 - MainProgram/MainRoutine - *5(MOV), *6(MOV)* | | | |
| | | | |
| **Ethernet_Idle** | 2#1 | BOOL | MainProgram |
| Constant | No | | |
| External Access: | Read/Write | | |
| *Ethernet_Idle - MainProgram/MainRoutine - *4(OTE), 3(XIC), 5(XIC), 6(XIC)* | | | |
| | | | |
| **Local:2:O** | | AB:Embedded_OB16:O.0 | Eriez_MD_test_ver_19 |
| External Access: | Read/Write | | |
| **Local:2:O.Data** | 2#1000_0010_0000_0100 | INT | |
| *Local:2:O.Data - MainProgram/MainRoutine - *0(MVM), *1(MVM), *2(MVM)* | | | |
| **Local:2:O.Data.15** | 1 | BOOL | |
| Ethernet Idle | | | |
| *Local:2:O.Data.15 - MainProgram/MainRoutine - *3(OTE)* | | | |
| | | | |
| **PB_0_SetProd1** | 2#0 | BOOL | MainProgram |
| PB Set Prod #1 | | | |
| AliasFor: | Local:1:I.Data.0(C) | | |
| Base Tag: | Local:1:I.Data.0(C) | | |
| Constant | No | | |
| External Access: | Read/Write | | |
| *PB_0_SetProd1 - MainProgram/MainRoutine - 6(XIC)* | | | |
| | | | |
| **PB_1_SetProd2** | 0 | BOOL | MainProgram |
| PB Set Prod #2 | | | |
| AliasFor: | Local:1:I.Data.1(C) | | |
| Base Tag: | Local:1:I.Data.1(C) | | |
| Constant | No | | |
| External Access: | Read/Write | | |
| *PB_1_SetProd2 - MainProgram/MainRoutine - 6(XIC)* | | | |
| | | | |
| **PB_2_SetProd3** | 2#0 | BOOL | MainProgram |
| PB Set Prod #3 | | | |
| AliasFor: | Local:1:I.Data.2(C) | | |
| Base Tag: | Local:1:I.Data.2(C) | | |
| Constant | No | | |
| External Access: | Read/Write | | |
| *PB_2_SetProd3 - MainProgram/MainRoutine - 6(XIC)* | | | |
| | | | |
| **PB_4_ReadProd** | 0 | BOOL | MainProgram |
| PB Read Prod | | | |
| AliasFor: | Local:1:I.Data.4(C) | | |
| Base Tag: | Local:1:I.Data.4(C) | | |
| Constant | No | | |
| External Access: | Read/Write | | |
| *PB_4_ReadProd - MainProgram/MainRoutine - 5(XIC)* | | | |
| | | | |
| **PLC_Running** | 2#1 | BOOL | MainProgram |
| Constant | No | | |
| External Access: | Read/Write | | |
| *PLC_Running - MainProgram/MainRoutine - *9(OTL), 9(XIO)* | | | |

RSLogix 5000

**ReadProdLatch**  2#0  BOOL  MainProgram
  Constant  No
  External Access:  Read/Write
  *ReadProdLatch - MainProgram/MainRoutine - \*5(OTU), \*6(OTL), 5(XIC)*

**RunningProduct**  2  INT  MainProgram
  Constant  No
  External Access:  Read/Write
  *RunningProduct - MainProgram/MainRoutine - \*7(MOV), 2(SWPB)*

**RxCmd**  0  INT  MainProgram
  AliasFor:  EzMD:I.Data[1](C)
  Base Tag:  EzMD:I.Data[1](C)
  Constant  No
  External Access:  Read/Write
  *RxCmd - MainProgram/MainRoutine - 4(MEQ), 8(MEQ)*

**RxHeartbeat**  2054  INT  MainProgram
  AliasFor:  EzMD:I.Data[5](C)
  Base Tag:  EzMD:I.Data[5](C)
  Constant  No
  External Access:  Read/Write
  *RxHeartbeat - MainProgram/MainRoutine - 1(MVM)*

**RxParam1**  0  INT  MainProgram
  AliasFor:  EzMD:I.Data[2](C)
  Base Tag:  EzMD:I.Data[2](C)
  Constant  No
  External Access:  Read/Write
  *RxParam1 - MainProgram/MainRoutine - 7(MOV)*

**RxStatus**  4  INT  MainProgram
  AliasFor:  EzMD:I.Data[0](C)
  Base Tag:  EzMD:I.Data[0](C)
  Constant  No
  External Access:  Read/Write
  *RxStatus - MainProgram/MainRoutine - 0(MVM), 0(SWPB)*

**Select_6_Display**  2#0  BOOL  MainProgram
  Display Heartbeat
  AliasFor:  Local:1:I.Data.6(C)
  Base Tag:  Local:1:I.Data.6(C)
  Constant  No
  External Access:  Read/Write
  *Select_6_Display - MainProgram/MainRoutine - 1(XIC), 2(XIO)*

**TxCmd**  255  INT  MainProgram
  AliasFor:  EzMD:O.Data[1](C)
  Base Tag:  EzMD:O.Data[1](C)
  Constant  No
  External Access:  Read/Write
  *TxCmd - MainProgram/MainRoutine - \*5(MOV), \*6(MOV), \*8(MOV), \*9(MOV), 4(MEQ), 5(MOV), 6(MOV), 7(MEQ), 8(MEQ)*

**TxParam1**  170  INT  MainProgram
  AliasFor:  EzMD:O.Data[2](C)
  Base Tag:  EzMD:O.Data[2](C)
  Constant  No
  External Access:  Read/Write
  *TxParam1 - MainProgram/MainRoutine - \*5(MOV), \*6(MOV), \*8(MOV), \*9(MOV), 5(MOV), 6(MOV)*

**work1**  1024  INT  MainProgram

PLC INTERFACE

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**work1 (Continued)**
swap status
Constant                           No
External Access:              Read/Write
*work1 - MainProgram/MainRoutine - *0(SWPB), 0(MVM)*

**work2**                              512                              INT                              MainProgram
swap prod number
Constant                           No
External Access:              Read/Write
*work2 - MainProgram/MainRoutine - *2(SWPB), 2(MVM)*

PLC INTERFACE

# SPARE PARTS LISTING

**FIGURE 1: CONTROL HOUSING**
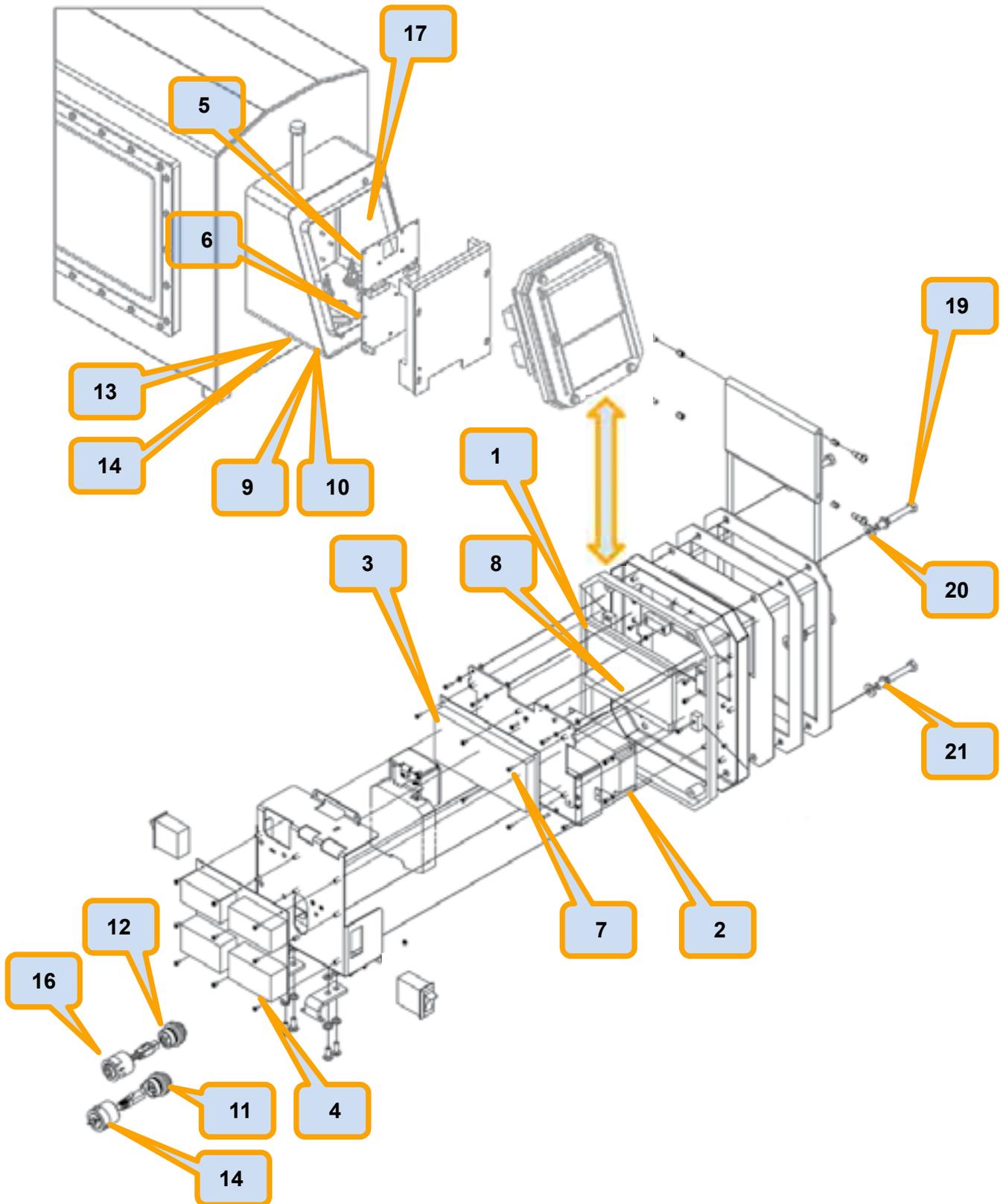
**1** LCD DISPLAY
P/N 826662
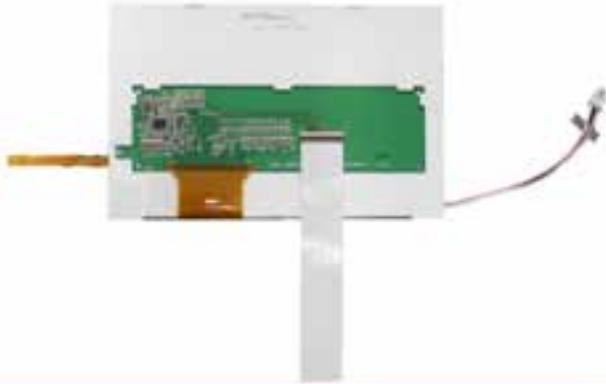


**2** 24V POWER
SUPPLY
P/N 463063



**3** IOP PCB
P/N 827159



**4** IOC PCB
P/N 827370



**5** O/R PCB
P/N 826847



FACTORY TECHNICIAN
REQUIRED FOR REPLACEMENT

**6** AMOS PCB
P/N 827567

| | | | |
|---|---|---|---|
| **7** | INDUSTRIAL USB FLASH DRIVE P/N 827766 | **8** | LCD DISPLAY TO IOP PCB CABLE 5" P/N 827689 |

INTERNAL DRIVE ON IOP PCB
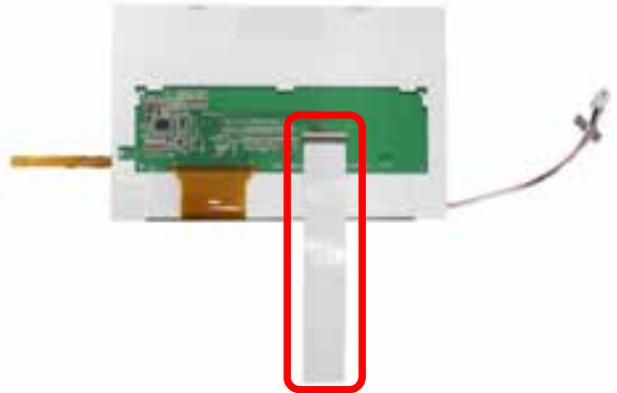
| | | | |
|---|---|---|---|
| **9** | CONTROL HOUSING VENT P/N 465771 | **10** | VENT BACKING NUT P/N 465773 |

| | | | |
|---|---|---|---|
| **11** | USB "A" PLUG CONNECTOR P/N 828000 | **12** | USB "B" PLUG CONNECTOR P/N 828013 |

A

B

SPARE PARTS

ERIEZ Xtreme METAL DETECTOR

| **13** ETHERNET PLUG P/N 465733 | **14** USB A/B ETHERNET CAP P/N 828001 |
|---|---|

PLUG ON CONTROL HOUSING

| **15** ETHERNET CABLE PLUG P/N 828025 | **16** ETHERNET CABLE CAP P/N 828024 |
|---|---|

CUSTOMER SIDE IP69K

CUSTOMER SIDE IP69K

| **17** DESICCANT PACK P/N 828021 | **18** IOC TO AMOS CABLE P/N 827761 |
|---|---|

LOCATED INSIDE CONTROL HOUSING

**19** M8 BOLT
45MM
P/N 438631

**20** SEALING
WASHER
P/N 435843

**21** NYLON SHOULDER
WASHER
P/N 826573

SPARE PARTS

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