

Section S Hole Detection Processing Unit – Model HDPU Operators Manual

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S.1 Introduction

When paired with a 10XHD-Series, 10XHS-Series or SHD-4000-Series sensor, the SCAN-A-LINE™ Hole Detection Processing Unit – Model HDPU is one of the most reliable and cost effective solutions for hole detection in the world today.

S.1.a Model HDPU Overview

The Model HDPU processing unit is designed to provide signal processing, operator interface and a regulated power source for a one or two SCAN-A-LINE™ Hole Detection sensor – 10XHD-Series, 10XHS-Series or SHD-4000-Series sensor Small Hole Detection sensor. The Model HDPU Level 1 {Figure S.1-1} is designed for one 10XHD-Series, 10XHS-Series or SHD-4000-Series sensor, while Model HDPU Level 2 will accept two sensors of one type or the other. Jumper selectable operating modes of the Model HDPU personality module(s) offer flexibility in sensor signal processing. A FAIL-SAFE circuit monitors sensor scans to insure system integrity. An ENABLE control input is available to engage or disengage the hole detect output relay with an external through-beam sensor or switch contact when no strip is present. One (or two) 6-position barrier strip(s), located on the personality module(s) inside the unit, is provided for customer interface with the relay outputs for hole detection and for monitoring the FAIL-SAFE circuit.

The Model HDPU consists of a steel enclosure, a linear power supply for either 117VAC or 220VAC operation, the hole detection personality module with protective panel, two indicator lamps, an ON/OFF switch on the door and power cord and sensor connections on the bottom panel. A spare hole is available on the bottom panel for customer attachment to the barrier strip(s) on the personality module(s). The Model HDPU Level 1 contains one Hole Detection Personality Module (with one barrier strip) and Level 2 contains two Hole Detection Personality Modules (each with one barrier strip), one for Sensor A and one for Sensor B. The two indicator lights on the front panel of the unit indicate:

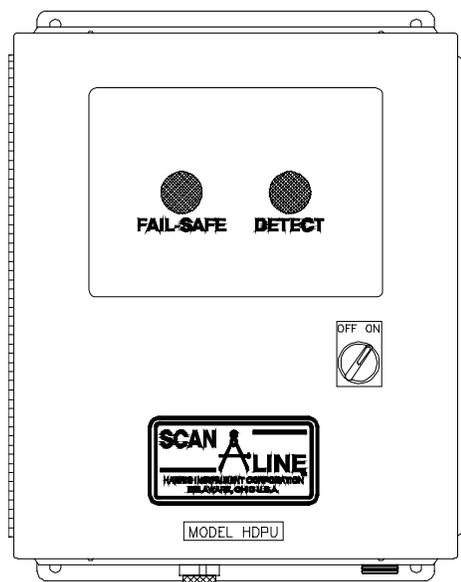


Figure S.1-1: Typical Model HDPU Level 1

Lamp Color	Description	ON	OFF
Green Indicator	FAIL-SAFE Status	Proper Function	System Failure
Red Indicator	Hole Detect Status	Hole Detected	No Holes Detected

Table S.1-1: Front Panel Indicator Lamps

S.1.b Functional Description

The Hole Detection sensor – 10XHD-Series, 10XHS-Series or SHD-4000-Series output video signals of 12VDC CMOS. This signal changes from logic zero state whenever the receiver detects the emitter light. The Model HDPU processes this signal in the Hole Detection Personality Module(s), located inside the Model HDPU enclosure under the protective panel(s) as well as the SYNC signal from the sensor (SYNC signal is 12VDC CMOS logic, positive going pulse of 5µsec). The FAIL-SAFE circuit monitors the SYNC signal from the sensor to insure that the sensor is scanning and that the power supply is operating properly. The FAIL-SAFE output is connected internally to a FAIL-SAFE relay and also to the green FAIL-SAFE Indicator mounted on the front panel of the processing unit. When the sensor is scanning properly, the FAIL-SAFE relay contacts will close and the green lamp will illuminate, indicating proper operation.

The 10XHD-Series sensor output can be used to count the edges detected in a scan. This feature offers greater versatility for the customer. When the edge counting mode is jumper selected in the personality module, the video input pulses are directed to an edge counting circuit and the edge counter is interrogated at the end of each scan. A hole detect output is triggered only when the proper number of edges (as determined by the mode selected) has been counted during the last scan. After the count has been tested, the counter is reset for the next scan. With the 10XHD-Series, 10XHS-Series or SHD-4000-Series sensors, when a hole (or the edge(s) and hole(s) are detected) the DETECT relay contact closes. Adjustment for the time period of relay closure is available in the Model HDPU. Relay closure can be set from 0.5 to 10 seconds using the Time Adjust dial located inside the front panel on the protective panel of the personality module {Figure S.1-3}.

The ENABLE control input is designed to disable or enable the hole detect circuitry. A through-beam sensor or switch can be attached to the ENABLE and COMMON connections on the customer barrier strip on the Personality Module to inform the Model HDPU that no strip is present and not to detect holes. Once the strip is placed on the line, the through-beam sensor or switch closes the circuit between ENABLE and COMMON, turning on the hole detection circuitry.

S.2 Operational Considerations

The Model HDPU is designed to operate in an industrial environment and can readily tolerate average factory conditions. Commonsense considerations for protection and maintenance of the Model HDPU will ensure it's operation for years to come.

NOTE:

If any welding is to be performed near the Model HDPU, or anywhere on the process line where the Model HDPU is installed, disconnect ALL cables from the Model HDPU. This prevents system overload by the current generated from welding.

S.2.a Temperature Range

Operational temperatures should fall in the range from 32°F to 122°F [0°C to 50°C]. Temperatures above 140°F [60°C] for prolonged periods of operation or storage can lead to the degradation of the integrated circuits in the Model HDPU. If temperatures outside the specified range are expected, special provisions should be made to protect the equipment.

S.2.b Vibration Considerations

SCAN-A-LINE™ processors can tolerate reasonable amounts of shock and vibration. The major problem with vibration is the increase in probability of loose hardware and/or connectors. Mount the Model HDPU to a solid, fixed mounting where vibration is at a minimum. When high levels of vibration or shock are likely, shock-absorbing mounts will reduce maintenance problems.

S.3 Specifications for Model HDPU

The electronics for the Model HDPU are housed in a steel enclosure. All enclosures are painted with corrosive resistant polane paint.

S.3.a Power Requirements

The Model HDPU Level 1 has a linear power supply and the Model HDPU Level 2 has a switching power supply.

A good system earth ground can be helpful in reducing the possibility of interference from other electrical equipment. Care should be taken to insure that the SCAN-A-LINE™ earth ground is separate from the grounds used by other systems. This is most important when high current (i.e., welding equipment) and high voltage is involved.

NOTE:

A good system earth ground can be helpful in reducing the possibility of interference from other electrical equipment. Care should be taken to insure that the SCAN-A-LINE™ earth ground is separate from the grounds used by other systems. This is most important when high current (ex. welding, cutting, etc.) and high voltage (ex. Hi Pot Testing) are involved.

Model HDPU Level 1

The Model HDPU Level 1 is powered by 105VAC to 125VAC at 50Hz to 60Hz (117VAC 50-60Hz at an input current not to exceed 2.0Amp optimal), with an optional 208VAC to 248VAC at 50Hz to 60Hz (220VAC 50-60Hz at an input current not to exceed 1.0Amp optimal) power supply available (220 Option). The power line input is filtered to suppress power line transient noise and power line induced RF interference. Quick Disconnect power line connections are made directly to the internal power line filter inside the enclosure (Section S.4.a). The input power is fused with a 2Amp Slo Blo type 3AG fuse (Figure S.3-1). Short circuits to the regulated supplies usually cause a thermal shutdown of the regulators without causing the fuse to blow. See Drawing #3489030 Rev. A and Figure S.3-1 for fuse location.

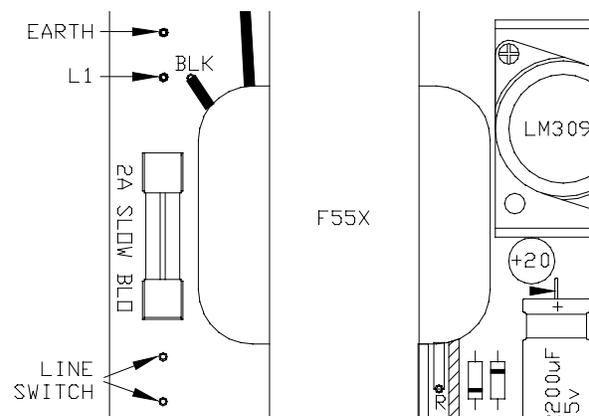


Figure S.3-1: Slo-Blo Fuse Location for Model HDPU Level 1

Model HDPU Level 2

The standard power requirements for the Model HDPU Level 2 are 85VAC to 264VAC at 47Hz to 440Hz. The power supply has UL1950 and CSA C22.2 safety approvals and meets FCC Class B conducted as well as VDE 0878 PT3 Class B EMI conducted noise limits. The power supply will automatically adjust for voltages between 85VAC and 264VAC with no jumpers or switch settings necessary. The power line is filtered to suppress power line transient noise and power line induced RF interference. Quick disconnect power line connections are made directly to the internal power line filter inside the Model HDPU enclosure. The power supply for the Model HDPU is located under a red warning panel in the top-left corner inside the enclosure.

The input power is fused with a 3.15Amp fuse (Littlefuse® Part # V216 3.15 or equivalent, Harris Instrument Part # 5500005) Short circuits to the regulated supplies will usually cause a thermal shutdown of the regulators without causing the fuse to blow. See Figure S.3-2 for the power supply fuse location.

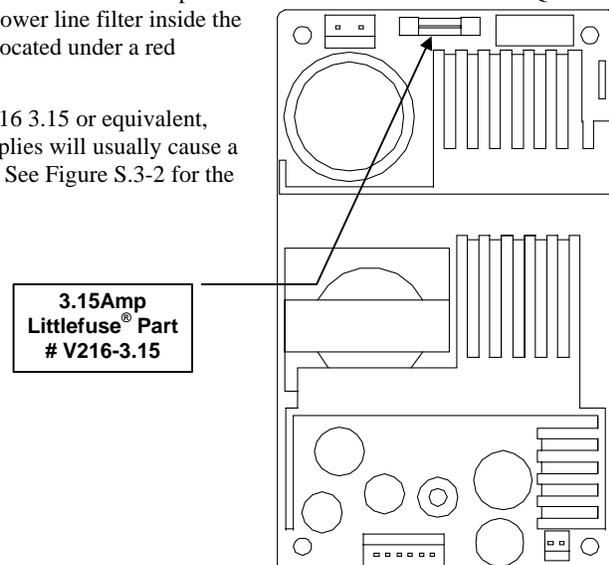


Figure R.3-2: Fuse Location on Power Supply for Model HDPU Level 2

S.3.b Relay Contacts

The two relay contacts for FAIL-SAFE and Hole Detection are available to the customer on the Personality Module at the barrier strip TB1 {Figures S.3-3 and S.1-2}. See Drawing #1493039 Rev. A for locations of the barrier strip. Positions 1 and 2 are for the FAIL-SAFE relay and positions 3 and 4 are for the DETECT relay.

Position #	Position Name	Description	Other Information
TB1-1 & TB1-2	FAIL-SAFE Relay	Normally Open (power off). Under normal operation this relay will be closed. It opens if system or power failure occurs.	250VAC 5Amp
TB1-3 & TB1-4	DETECT Relay	Normally Open (power off). Under normal operation this relay will be open. It closes if hole is detected.	250VAC 5Amp

Table S.3-1: Customer Connections Pin Descriptions

NOTE:

ENABLE and COMMON are tied together from factory {Figure S.3-3}.

S.3.c Physical Dimensions

The Model HDPU is housed in a steel enclosure measuring 12 inches [305mm] wide by 14 inches [356mm] tall by 6 inches [152mm] deep and painted with corrosive resistant polane paint. The weight of the unit varies slightly with selected options but is approximately 15.5 pounds [7kg]. Sensor connections are located on the bottom panel through 7-pin MS-style circular connectors on the bottom panel. The Model HDPU Level 1 has one connector and the Model HDPU Level 2 has two connectors. System power is connected through an IMC conduit cord grip located to the left of the spare hole on the bottom panel. See Drawing # 1298186 for Model HDPU Level 1 and 1298187 for Model HDPU Level 2 dimensions and bottom panel layout.

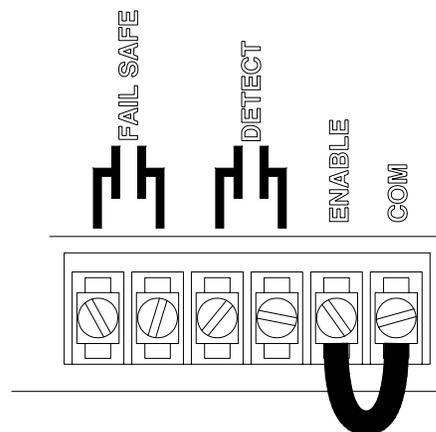


Figure S.3-3: Model HDPU Barrier Strip

S.3.d Unit Configurations

The Model HDPU is available in configurations to meet a variety of application requirements. The various configurations may be specified as on the table on the following table:

Model Name	Description	Name Tag Designation
HDPU Level 1	Designates the processing unit with a linear power supply for one (1) 10XHD-Series, 10XHS-Series or SHD-4000-Series sensors.	HDPU-1
HDPU Level 2	Designates the processing unit with a switching power supply for two (2) 10XHD-Series, 10XHS-Series or SHD-4000-Series sensors.	HDPU-2

Table S.3-2: Level Descriptions for the Model HDPU

S.4 Installation

When installing the Model HDPU processing unit, some commonsense procedures to protect the unit from damage should be taken. Install the Model HDPU in a position near the line where it is protected as much as possible. Once properly installed, the Model HDPU will provide a lifetime of reliable operation.

Mount the Model HDPU vertically, with the cable and power connections pointed towards the floor. There are four mounting holes on the top and bottom flanges of the processing unit. The Model HDPU requires a good ground, so be sure to use the three-prong power cord for connecting system power. If running power through conduit, ensure that the system power has an adequate ground.

S.4.a AC Power

The Model HDPU comes standard with a three-prong AC power cord for 115VAC operation. Figure S.4-1 shows the wire connections to the line filter located on the inside-bottom panel of the Model HDPU enclosure. If replacing the standard three-prong AC power cord with conduit, **BE SURE THAT THE LINE AND NEUTRAL CONNECTIONS MATCH FROM THE POWER SOURCE SIDE TO THE POWER SUPPLY SIDE!**

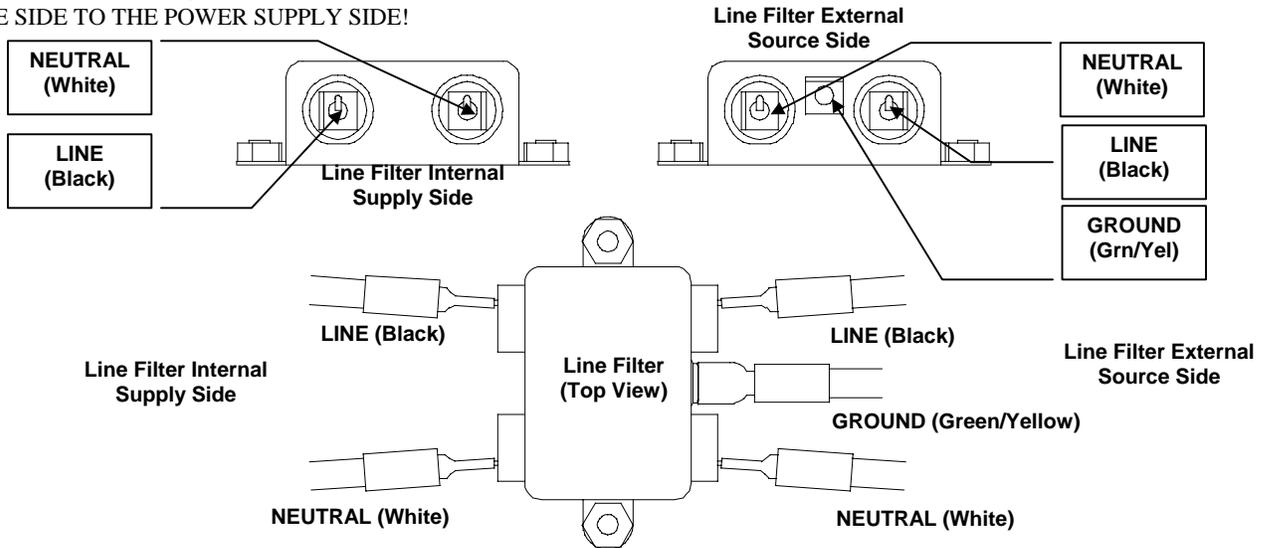


Figure S.4-1: Line Filter for AC Power Connection in Model HDPU

S.4.b Sensor Connections

Inspect the emitter-to-processing unit cable that connects the sensor with the Model HDPU. Verify that the connectors are free of foreign materials and check the number of pins on each connector. Typically, the Model HDPU Level 1 will connect one 7-pin emitter cable for a 10XHD-Series, 10XHS-Series or SHD-4000-Series sensor; the Model HDPU Level 2 will connect two 7-pin emitter cables, one for each 10XHD-Series, 10XHS-Series or SHD-4000-Series sensor.

With the Model HDPU Level 1, connect the emitter cable to the upper-right 7-pin circular MS-style connector on the bottom panel of the unit {Figure S.4-2 top}. With the Model HDPU Level 2, connect Sensor A to the upper-right 7-pin circular MS-style connector and Sensor B to the lower-right connector {Figure S.4-2}.

NOTE:

If any welding is to be performed near the Model HDPU sensor, DISCONNECT ALL POWER LINES and CABLES from the processing unit to prevent damage to the unit.

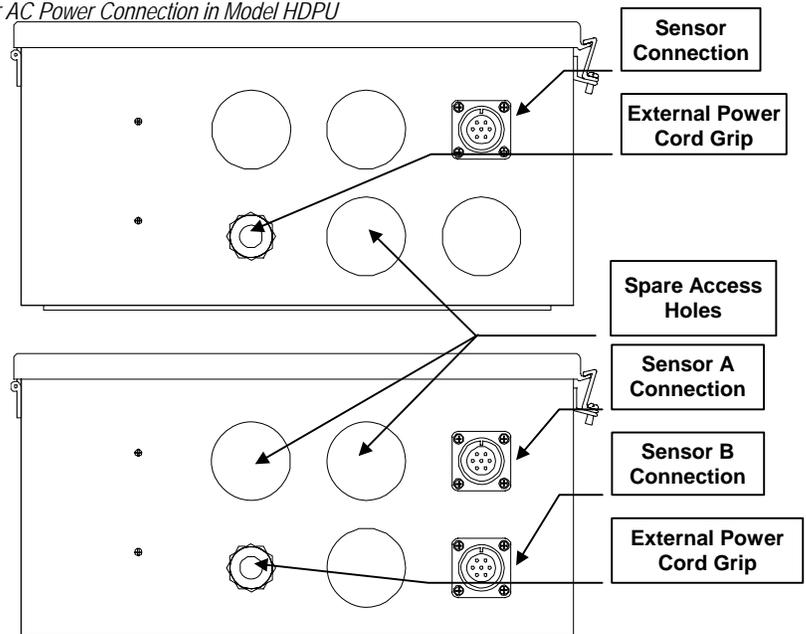


Figure S.4-2: Model HDPU Level 1 (top) and Level 2 (bottom) Bottom Panel Layouts

S.4.c Relay Connections

The DETECT and ENABLE relays on the Hole Detection Personality Module are available inside the Model HDPU on one (Model HDPU Level 1) or two (Model HDPU Level 2) 6-position terminal blocks {Figure S.4-3}. Access to the interior of the processing unit can be made through one of the spare access holes on the bottom panel of the processing unit {Figure S.4-2}.

Information on the relay specifications can be found in Section S.3.b.

S.4.d Operational Modes

There are four jumper settings to select the operational mode of the Hole Detection Personality Module. These settings determine whether the system will detect just holes, holes and edges or any hole. See Figure S.4-4 and Drawing #1493039 Rev. A in Section S.7 for locations of the jumpers used to set the Model HDPU operation mode.

NOTE:

To gain access to the jumpers for mode selection, remove the blue plastic cover panel located inside the enclosure. To remove the cover panel, use small pliers to depress the locking latch on each corner of the plate while gently pulling the plate out until the pins are clear of the cover panel.

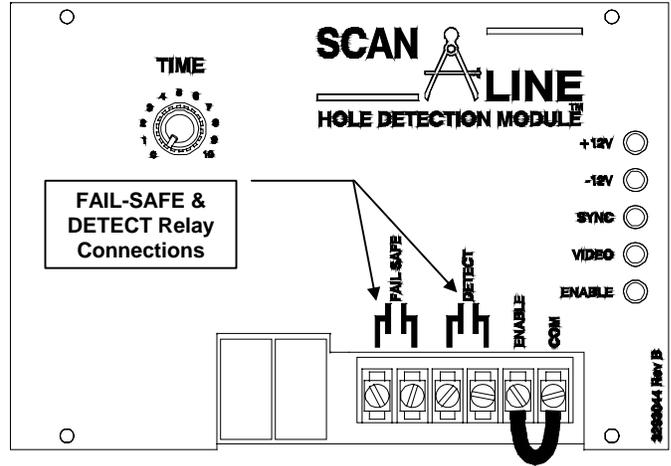


Figure S.4-3: Relay Connections on Hole Detection Personality Module

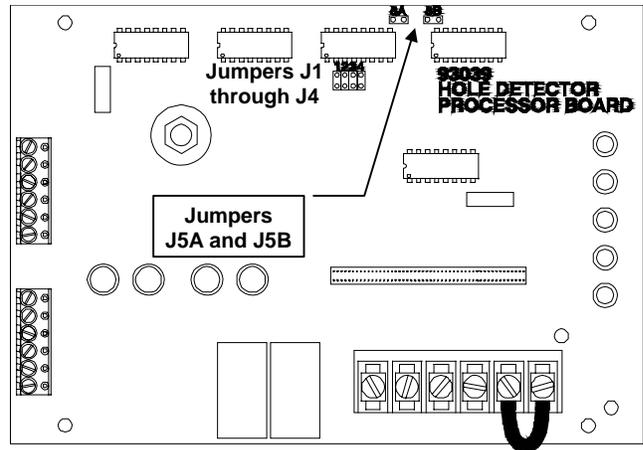


Figure S.4-4: Hole Detection Personality Module Jumper Locations

For 10XHD-Series Emitters ONLY:

Operational Mode	Jumper Settings	Description
Detect One Hole ONLY with 10XHD-Series Emitter Completely Covered Standard Setting from Factory	J1, J5B Closed; J2, J3, J4, J5A Open	Strip always covers emitter and unit detects one hole.
Detect one hole and 2 edges	J3, J5B Closed; J1, J2, J4, J5A Open	Unit detects two edges and one hole, one hole & two edges or Completely covered & two holes.
Detect Two Holes and One Edge with 10XHD-Series Emitter Partially Covered	J4, J5B Closed; J1, J2, J3, J5A Open	Unit detects one edge AND two holes
Detect ANY Holes with 10HD-Series	J5A Closed; J1, J2, J3, J4, J5B Open	Detects any hole in strip.

Table S.4-1: Hole Detection Personality Module Jumper Settings (See Figure S.4-4 for Jumper Locations)

For 10XHS-Series Emitters ONLY:

Operational Model	Jumper Settings	Description
Detect ANY Holes with 10XHS-Series	J5A Closed; J1, J2, J3, J4, J5B Open	Detects any hole in strip

For SHD-4000-Series Emitters ONLY:

Operational Model	Jumper Settings	Description
Detect One Hole with SHD-4000 Emitter End or Ends Exposed by Strip Edges. Note: Always cover connector end first.	J1, J5B Closed; J2, J3, J4, J5A Open	Detects one hole with both ends covered or one hole & connector end covered.
Detect Two Edges & One Hole	J3, J5B Closed	Detects one hole with both edges of emitter exposed.
Detect ANY Holes with SHD-4000 Sensor	J5A Closed; J1, J2, J3, J4, J5B Open	Detects any hole in strip. Sensor must remain completely covered.
Reserved for other sensor types	J2, J3, J4 (leave open)	Used with 10XHD-Series Sensors and SHD-4000

S.4.e ENABLE Switch Jumper

Typically, the ENABLE Switch jumper on the Hole Detection Personality Module is shipped CLOSED from the factory with a small wire jumper closing positions TB-5 and TB-6 on the terminal block (Figure S.4-5). These connections can be used in conjunction with a strip detection sensor (or other similar device) that will tell the Model HDPU when there is no strip present. In this fashion, the Model HDPU will not give invalid hole detection announcements when there is no strip present.

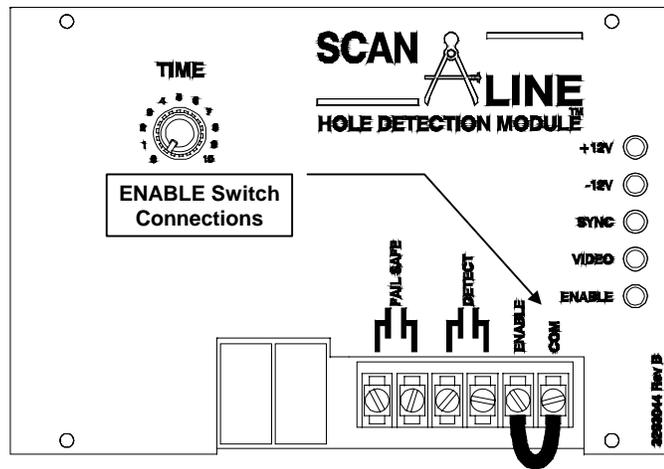


Figure S.4-5: Relay Connections on Hole Detection Personality Module

Pin #	Pin Name	Description	Other Information
TB1-5	ENABLE	Tied with COMMON when no external strip detector is present.	Connect POSITIVE lead from external switch or through-beam sensor for disabling hole detection.
TB1-6	COMMON	Tied with ENABLE when no external strip detector is present.	Connect COMMON lead from external switch or through-beam sensor for disabling hole detection.

Table S.4-2: ENABLE Jumper Specifications

S.4.f Time Adjust Control

Whenever the hole detect circuit has been triggered, a timer is activated to operate the hole detect indicator lamp and the hole detect relay. The timer output can be adjusted for times from 0.5 to 10 seconds using the TIME ADJUST control dial located on the cover panel of the Hole Detect Personality Module (Figure S.4-6). Each individual graduation on the dial is approximately one second.

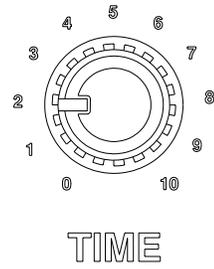


Figure S.4-6: Time Adjust Dial

S.5 General Maintenance

All SCAN-A-LINE™ processing units are highly reliable and tolerant to most industrial environments. Maintenance of the Model HDPU after installation is extremely limited. Since there are no moving parts in the Model HDPU, there is nothing to lubricate. If any form of maintenance is performed on the line near the Model HDPU, be sure to disconnect all cables from the unit.

NOTE:

If welding is to be performed anywhere on the process line where the Model HDPU is installed, disconnect ALL cables from the Model HDPU. This prevents a system overload (and associated damage) from the current generated by the welding.

The only typical maintenance for the Model HDPU processing unit is:

- 1) Check all cable connections. All connections should be snug.
- 2) Make sure all cables are free of cuts, nicks or crimps. Replace cables if they are damaged.

NOTE:

Damaged cables can cause serious damage to the entire Hole Detection System. Repair or replace damaged cables as soon as the damage is discovered to prevent voiding the system warranty.

- 3) Check power connections and insure that power is available to the unit.
- 4) Check all mounting fixtures. Tighten if necessary. In high vibration environments, mounting plates can vibrate loose. If vibration is still causing problems, simple vibration dampening can solve most vibration interference.

S.5.a Replacing Indicator Lamps

The only user serviceable parts with the Model HDPU are the indicator lamps on the front panel of the unit. These lamps can be field replaced. Experienced and qualified personnel only should perform ANY maintenance of the Model HDPU. Contact Harris Instrument Corporation Service for replacement lamps.

- 1) Switch the ON/OFF switch on the unit to the OFF position. Remove power from the processing unit.

CAUTION:

To avoid personal injury and damage to the equipment, remove 117VAC (or 220VAC if applicable) power line from the processing unit BEFORE performing any maintenance or tests on the system.

- 2) Grasp the indicator lamp cover firmly and turn counter-clockwise. Cover should loosen and be removable after approximately three turns.
- 3) Gently grasp the lamp filter and pull the filter and it's accompanying gasket out of the lamp fixture.
- 4) Using fingers, or a lamp extraction tool (not included), press gently down on the bulb and turn counter-clockwise for approximately ½ rotation. The bulb should then tend to spring out of the socket. Remove old bulb from socket.
- 5) Insert new bulb into the socket with the retaining pins on the bulb at approximately the 10 o'clock/4-o'clock position. Press down gently on the bulb while turning the bulb counter-clockwise for approximately ½ or until the bulb stops turning. Release the bulb and insure that the bulb springs up into the locked position.
- 6) Replace the lamp filter and gasket, noting the positioning keys (notches) on the filter are in the correct position.
- 7) Replace the indicator lamp cover onto the lamp fixture and turn the cover clockwise approximately three turns. Firmly tighten the lamp cover onto the fixture to insure that the gasket seals properly with the cover
- 8) Reconnect system power and return ON/OFF switch to the ON position. Both lamps should briefly light when the power switch is first turned to the ON position. If the lamp is still not functioning, please call Harris Instrument Corporation Service Department for assistance. The failure of the lamp to illuminate may be a symptom of a different type of malfunction.

S.6 Trouble Shooting

The following procedures are designed to isolate faulty components in systems that are installed and have been operating properly. This section only covers component or major assembly level trouble shooting. Sub-assembly or board level trouble shooting is NOT RECOMMENDED with SCAN-A-LINE™ equipment and may VOID THE WARRANTY. For installation problems, see the installation portion of this manual, or contact your SCAN-A-LINE™ representative or Harris Instrument Corporation for more information.

CAUTION:

To avoid personal injury and damage to the equipment, remove 117VAC (or 220VAC if applicable) power line from the processing unit BEFORE performing any maintenance or tests on the system.

S.6.a Preliminary Inspection

- 1) Begin with a thorough visual inspection of the system under test. Before testing for circuit malfunctions, ensure the power switch is ON and that power is supplied to the system.
- 2) Verify that the emitter and receiver lenses are unbroken, reasonably clean and free of foreign material. Cracked lenses, excessive dirt and foreign material on the lens can cause the system to perform incorrect detections.
- 3) Examine all cables for cuts, nicks or crimps that could cause open or short circuits. Ensure that all connectors are secure and free of foreign material.
- 4) The FAIL-SAFE and DETECT lamps on the front panel are incandescent lamps. Switch the ON/OFF switch to OFF, then back to ON. The lamps will light momentarily when power is turned on if they are working correctly. If the lamps do not light, refer to Section S.5.a for information on replacing the lamp(s).
- 5) Remove power from the Model HDPU, open the enclosure and check that all wires connected to terminal blocks and barrier strips are secure. Tighten any loose connections. Remove any foreign material from the enclosure. Close enclosure and return power to system.

NOTE:

Caution should be taken when replacing possibly defective components with known good spares. Serious damage may occur to the known spares, as well as other components of the system. If there are any doubts about the condition of a spare, or the malfunctioning system, please contact Harris Instrument Corporation Service for assistance.

S.6.b Diagnostic Indicators

This section details the five diagnostic LED indicators located inside the Model HDPU case along the right-hand edge of the hole detection personality module.

- 1) When the diagnostic indicators are functioning properly:
 - a) The +12VDC and -12VDC indicators should be fully lit when power is turned on to the unit.
 - b) The VIDEO indicator will light more brightly as the receiver detects more of the emitter light. When the emitter is completely covered, the lamp should not light. If the indicator is still lit when the emitter is completely covered, there may be a problem with ambient light interference. Please contact Harris Instrument Corporation Service for technical assistance.
 - c) The SYNC indicator lights when a valid start of scan sync pulse is being received from a working sensor.
 - d) The ENABLE indicator lights when the enable jumper is installed or an external enable switch is closed.
- 2) No diagnostic indicators are lit. This condition may signal a short circuit somewhere external from the processing unit, or may indicate a major malfunction in the processing unit itself.
 - a) Disconnect the emitter cable(s) and remove power from the processing unit. Check the 2Amp 3AG power line fuse located inside the Model HDPU case next to the power transformer on the main power supply board.
 - b) If the fuse is blown, replace it with a new fuse of the same type and rating. Restore power and reconnect the system in the following steps:
 - 1) Connect just the emitter cable to the Model HDPU. The +12V and -12V indicators should be fully lit. If not, the cable is defective.
 - 2) Now connect the emitter to the emitter cable. The +12V and -12V indicators should be fully lit. The SYNC indicator should also be lit. If some or none are not fully lit, then the emitter is malfunctioning.
 - 3) Finally, connect the receiver cable to the emitter. The +12V, -12V, and SYNC should be lit and the VIDEO should light when the emitter is fully uncovered. If all but the VIDEO indicators light, the receiver may be malfunctioning.
 - c) If the fuse is not blown, either the system power supply or the Hole Detection Personality Module is malfunctioning. Contact Harris Instrument Corporation Service for more assistance.

- 3) +12V and/or -12V indicators are not lit.

These indicators should be fully lit when the +12V and -12V regulators are operating. A malfunctioning power supply or external short circuit in the system is indicated if the lights are not fully illuminated.

- a) External short-circuit. Disconnect the emitter cable from the Model HDPU connector. If the +12VDC and -12VDC indicators are still dark, check for a blown fuse (see previous test).
- b) If the +12V and -12V indicators light properly when the emitter cable is disconnected, there is an external short circuit in either the emitter itself, the receiver, or the emitter cable.
 - 1) Connect just the emitter cable to the Model HDPU. The +12V and -12V indicators should light fully. If not, the cable is defective.
 - 2) Connect the emitter to the emitter cable. The +12V, -12V and SYNC indicators should light fully. If not, the emitter is malfunctioning. Replace the emitter with a known good spare.
 - 3) Connect the receiver cable to the emitter. The +12V, -12V, SYNC and VIDEO indicators should be fully lit (VIDEO is fully lit if the emitter window is fully uncovered). If not lit, the receiver is malfunctioning. Replace the emitter with a known good spare.

- 3) VIDEO indicator does not change brightness.

The VIDEO indicator should light brightly when there is nothing between the emitter and the receiver to block the path. It should be completely extinguished when the path is completely blocked. There are several possible causes for incorrect lighting of the VIDEO diagnostic indicator.

- a) Receiver cable is defective. Examine the cable for cuts, nicks or crushed sections. Replace the cable with a known good spare to see if this corrects the problem.
- b) Receiver is defective. A defective receiver can cause the VIDEO indicator to be stuck on or off. Substitute a known good spare receiver and cable to see if this corrects the problem. If not, replace the receiver.

- 4) SYNC indicator is not lit.

The SYNC diagnostic indicator should light brightly when the emitter is attached to the processing unit.

- a) Emitter cable is defective. Substitute with a spare cable. Check for foreign material or corrosion in the connectors. Verify cable continuity with Drawing #3486060A located in the 10XHD-Series Operators Manual.
- b) Emitter is malfunctioning. After cable has been verified, substitute a known good emitter or a SCAN-A-LINE™ Model DSA-230 Diagnostic Signal Analyzer for the current emitter. If the known good spare emitter, or the Model DSA-230 causes the SYNC indicator to light, the old emitter is malfunctioning.
- c) The Hole Detection Personality Module is malfunctioning if the previous tests do not make the SYNC indicator light. Contact Harris Instrument Corporation Service for technical assistance.

- 5) ENABLE indicator is not lit.

The ENABLE indicator is designed for systems that utilize an external sensor or switch to enable the hole detect output circuit.

S.7 Related Drawings

The following pages contain various drawings for the Model HDPU. For drawings of other configurations, please contact Harris Instrument Corporation Engineering. All mechanical drawings are available as AutoCAD® .DWG files for a minimal charge. Please contact Harris Instrument Corporation Sales.

Drawing #	Description	Drawing Format
<i>1298186</i>	<i>Model HDPU Level 1 Dimensions</i>	<i>AutoCAD LT Rel. 3</i>
<i>1398186 Rev. A Pg. 1</i>	<i>Model HDPU Level 1 Interior View</i>	<i>AutoCAD LT Rel. 3</i>
<i>1398186 Rev. A Pg. 2</i>	<i>Interior View Legend</i>	<i>AutoCAD LT Rel. 3</i>
<i>1298187</i>	<i>Model HDPU Level 2 Dimensions</i>	<i>AutoCAD LT Rel. 3</i>
<i>1398187 Rev. A Pg. 1</i>	<i>Model HDPU Level 2 Interior View</i>	<i>AutoCAD LT Rel. 3</i>
<i>1398187 Rev. A Pg. 2</i>	<i>Interior View Legend</i>	<i>AutoCAD LT Rel. 3</i>
<i>1489030 Rev. A</i>	<i>Linear Power Supply Main Board Assembly</i>	<i>AutoCAD LT Rel. 3</i>
<i>1493039 Rev. A2</i>	<i>Hole Detection Personality Module Assembly</i>	<i>AutoCAD LT Rel. 3</i>
<i>Table S.7-1: Drawing Information</i>		