

Technical File Manual

Image 4040

**High definition for
customizing cases**



101075



A DOVER COMPANY



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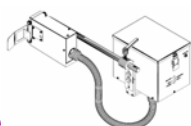


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1. Introduction

Disconnect the machine from the mains before any operations requiring modules or components to be removed or exchanged.

Liability

Imaje cannot be held responsible if safety instructions and basic safety rules for using and servicing the products are not followed.

Any modification or intervention is the responsibility of the user as far as its possible consequences are concerned.

The same applies to any use of the product that fails to comply with Imaje specifications.

Any modification carried out may be counter to product compliance and the relevant safety standards.

Therefore, Imaje cannot be held liable for any malfunction or damage caused by any modification of the use as recommended by Imaje, or for any incident arising from use of the product for any purposes other than those for which it is designed. It is the sole responsibility of the user to take the precautions required by any use to which he or she puts the product.

Use

Only use Imaje original spare parts and consumables (ink, cleaning products, and other servicing products).

Other types of consumables should not be used without Imaje's written approval, and any consequences shall be under the entire responsibility of the user.

Servicing

Disconnect the Imaje 4040 Large Character Ink Jet Printing System from the mains before any operations requiring components to be removed or exchanged.

Use appropriate tools for any work on the electrical and ink circuits.

We recommend that the interventions be carried out by persons who have been given the appropriate technical training proposed by Imaje.

Conditions

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Safety Requirements

Image disclaims all responsibility regarding the CE directive if the printer is used, altered or installed in any way other than described in this manual.



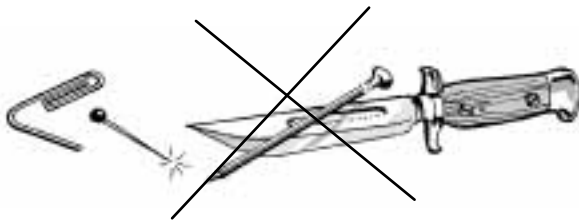
This symbol is used to indicate circumstances that may be dangerous to the user or that cause damage to the equipment.



This symbol is used to draw your attention to important information that will facilitate work or operations.

Please Note the Following Warnings:

- Never use sharp or pointed tools when cleaning or replacing the print head.



- The nozzle plate on the printer head is sensitive to handling. Contact with this surface must be minimized to prevent damage to the nozzle plate. Damage to the nozzle plate surface can cause a reduction in the performance of the print head.

- **If the XJ-500/ XJ-128 nozzle plate requires cleaning – flood the nozzle plate with the appropriate cleaner (see chapter 4 – Priming the print head). Use only Image authorized cleaners. Never clean the nozzle plate with tools. Never wipe the nozzle plate.**

- Never point the nozzle end of a print head at yourself or another person.



- Please read all instructions before using the printer for the first time.
- The printer should be connected to the power supply indicated on the voltage plate. If you are unsure of the type of power supply available, please contact Imaje service personnel.
- The printer should be connected to a grounded socket.
- The printer is equipped with a plug suitable for grounded sockets. This is a safety measure. If the plug does not fit the power socket, a qualified electrician must replace it.
- We do not recommend the use of extension cables.
- The power cable must not be subjected to pressure. Ensure that the printer is not placed anywhere where the cable can be put under pressure.
- Check that the power switch is off (in the '0' position) before connecting the power cable.
- Do not attempt to open the electronic unit or other sealed parts! The user cannot service these parts.
- Never expose the unit to high humidity or liquids.
- Ensure that the lighting at the installation site is in accordance with local regulations.
- All chemicals, even ink, may present unknown health hazards, and should be treated with caution.

Disconnect the power to the printer and call in qualified personnel under the following conditions:

- The power cable or plug is damaged or worn.
- Liquid has been spilled on the printer.
- Rain or water has leaked into the printer.
- The printer is not functioning correctly although the user has followed the instructions.
- The printer has been dropped or the casing has been damaged.
- The printer is not functioning correctly and requires service.



Certification and Approvals



The Imaje 4040 printers are certified in accordance with the requirements for CE marking.

CE = European Commission



The Imaje 4040 printers are certified in accordance with the requirements for ETL marking.

ETL = Electrical Testning Labs



The Imaje 4040 printers are certified in accordance with the requirements for the FCC.

FCC = Federal Communications Commission

CE Standards & Directives

Imaje 4040 printers are in accordance with the following European directives applicable to the products:

- The electromagnetic compatibility directive, EMC Directive 89/336/CEE, and its corresponding European standards.
- The Low Voltage Directive 93/68/CEE, and its corresponding European standards.
- The Machine Directive AFS 1994:48 (98/37/EC), and its corresponding European standards.
- ETL listed: Conforms to ANSI/UL STD 60950.
CERTIFIED TO CAN/CSA C22.2 STD NO.60950-00.

The above referenced product bears the CE mark.



Technical Specifications (Hardware)

General Description

The 4040 controller is a high-resolution ink jet printing system. This ink jet printer utilizes state of the art Impulse Piezo printhead technology capable of utilizing a wide variety of inks to print onto a wide variety of media at very high resolution.

Controller:

Pentium class processor based PC-104 industrial computer. Running the Windows XP operating system.

Printhead Expansion:

Up to four printheads per controller. Field expandable, add a printhead driver card in 10 minutes. No need to send into factory or pay for a technician's visit. Mix and match printhead types with easy "plug and play" technology.

User Interface:

10.4" TFT Color flat panel display with 800x600 resolution.

Integrated, rubberized, waterproof industrial mouse.

Industrial membrane QWERTY keyboard.

WYSIWYG (what you see is what you get) software. See Software specifications.

Input/Output (I/O):

Printhead Ports: 4

Product Detector Port: 2. *Can be used independently or linked together.*

Encoder Port: 2. *Can be used independently or linked together.*

Serial Ports : 1-RS232, 1-RS232,422,485 (Configurable)

Parallel Port : 1

USB Port: 1 **Allows easy upload of messages created off line, database files, graphics or software updates via any type of USB device. And with Windows XP technology there are no worries about drivers.*

Ethernet (LAN) Port: 1 (10/100 base T). *For networking using Net-Jet™ software.*

PS2 Port: 1. *For use with external keyboard, PS2 Wedge scanner, etc.*

Video Port: 1. *For use with external monitor.*

Processor:

Via-Eden Pentium class 400MHZ and 800 MHZ standard.

Memory:

Operating Memory: 256mb PC100 D-RAM

Image Memory: 8MB, *capable of printing an image up to 500 nozzles tall at 360 DPI up to 8 feet in length.*

Storage:

20GB Hard Drive (minimum) *Message storage is virtually unlimited.*

Electrical Requirements:

120VAC/60HZ, 240VAC/50HZ

Environmental Ratings:

Operating temperature 0-50 deg. C, 32-122 Deg. F. to 90% RH, non-condensing

Cabinet Construction:

Stainless Steel, splash proof design features gasket seal protection.

Safety Agency Compliance:

UL, CE, TUV, GS, CSA

3. System Specifications



Printheads:

XJ128-200:

- Nozzle Count: 128 nozzles (all points addressable)
- Horizontal Resolution: 200 DPI
- Vertical Resolution: 185 DPI, Capable of printing razor sharp graphics and reliable bar codes.
- Print Speed: 140 Feet per minute (FPM) at 200 DPI.
- Maximum Print Height: 0.7 inches (17mm)
- Ink: Oil, Solvent, UV (*UV types are limited in this head due to lack of temperature compensation*).
- Throw distance: Optimal-1mm, Maximum-5mm
- Shock resistance: Since the Xaar printheads were originally designed for desktop and wide area format printers; they are designed to be able to be moved very rapidly. Thus, these printheads are extremely robust, tolerate shock and resist depriming far better than most other industrial printheads such as Trident printheads.
- Operating temperature: 35 deg. F (2C) to 105 deg. F (41C). *These temperatures are designated for optimal performance and are conservative. The printhead can actually perform fairly up to 115 Deg. F (46C).*

XJ500-180

- Nozzle Count: 500 nozzles (all points addressable)
- Horizontal Resolution: 200 DPI
- Vertical Resolution: 180 DPI, Capable of printing razor sharp graphics and reliable bar codes.
- Print Speed: 150 Feet per minute (FPM) at 200 DPI.
- Maximum Print Height: 2.8 inches (70mm)
- Ink: Oil, Solvent, UV
- Throw distance: Optimal-1mm, Maximum-5mm
- Shock resistance: Since the Xaar printheads were originally designed for desktop and wide area format printers; they are designed to be able to be moved very rapidly. Thus, these printheads are extremely robust, tolerate shock and resist depriming far better than most other industrial printheads such as Trident printheads.
- Operating temperature: 35 deg. F (2C) to 105 deg. F (41C). *These temperatures are designated for optimal performance and are conservative. The printhead can actually perform fair at up to 115 Deg. F (46C).*

Ink Delivery System:

- The IDS-128 ink delivery system utilizes a 500ml disposable bag in box ink cartridge. This IDS is currently used in conjunction with the XJ128 and XJ126 printheads. It is made of Stainless Steel and chemically inert materials to be compatible with solvent, oil, UV, and aqueous based inks. Using this IDS, the XJ126 and XJ128 may be set up to print at almost any angle.
- Flashing red Ink Low LED.
- The IDS2-500 ink delivery system utilizes a 500ml disposable bag in box ink cartridge. The IDS2-500 can also be fitted with a bulk feed ink delivery system called "Ultra-Tank™". This IDS is currently used in conjunction with the XJ500 printhead. It is made of Stainless Steel and chemically inert materials to be compatible with solvent, oil, UV, and aqueous based inks. Using this ID, the XJ500 may be set up to print horizontally, vertically or at 45 a degree angle.
- Flashing red Ink Low LED.

Print Module:

- The Print Module consists of the printhead, ink delivery system and printhead bracket assemble as one assembly, ready to install. This is available in several variations.

Inks:

Types: Oil base, Solvent Base, UV Curable, Security (invisible), USDA, IR readable.
Colors: Cyan, Magenta, Yellow, Black, Red, Blue, Green, White Opaque, Yellow Opaque, Orange Opaque, Powder Blue Opaque.

Imaje 4040

4. Controller



- The controller is a Windows XP Professional based industrial computer.

Maintenance

The controller requires very little maintenance.

Monthly: Check the fan filters on the bottom of the controller for excessive build up. If clogged up, they need to be removed and either washed with water, or blown off with air.

Service/Troubleshooting:

Adding or Replacing a Driver Board

You may need to add a driver board for driving additional print heads



Figure 1: Tools Required to Add/Replace a Driver Board

Tools Required

1. One Philips Screw Driver (Small tip).
2. One 5mm nut driver.



Figure 2: Removing Jack Screws

Step 1 Remove Jack Screws

3. With power off, set the Controller onto a firm flat workspace.
4. Rotate Controller onto its side.
5. Remove the Jackscrews from any currently installed Driver Boards (indicated by H1-H4).

Image 4040

4. Controller

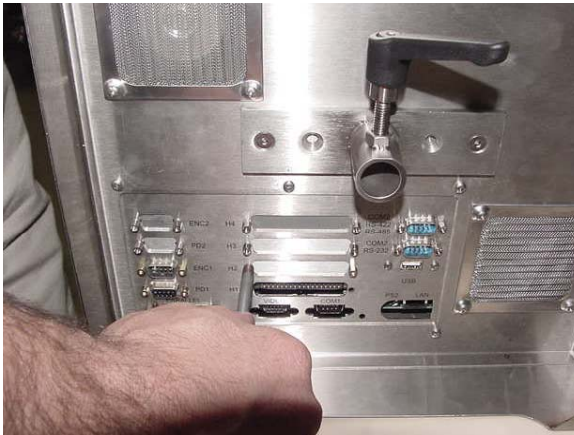


Figure 3: Removing Cover Plate

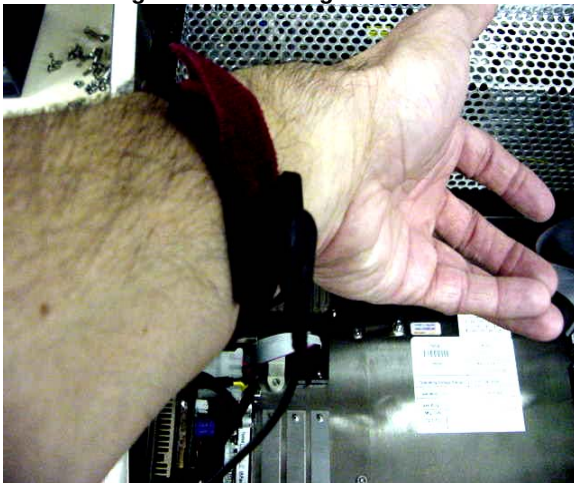


Figure 4: Attaching Anti-Static Wrist Strap



Figure 5: Loosening PCB Mounting Plate

Step 2 Removing Cover Plate.

6. If expanding a controller (adding printheads) remove the Driver Board Cover Plate(s).
7. Remove H2-H4 depending on how many boards you are adding.

Step 3 Attaching Anti-Static Wrist Strap.

8. Attach Anti-Static strap to wrist and
9. Connect the clip to the case for proper ground. *Make sure that the Mains (AC) cable is connected to power, but power turned off*

Step 4 Loosen PCB Mounting Plate

10. Using a Philips Screw Driver, loosen (do not remove) all four screws in the slotted holes on the PCB mounting plate.

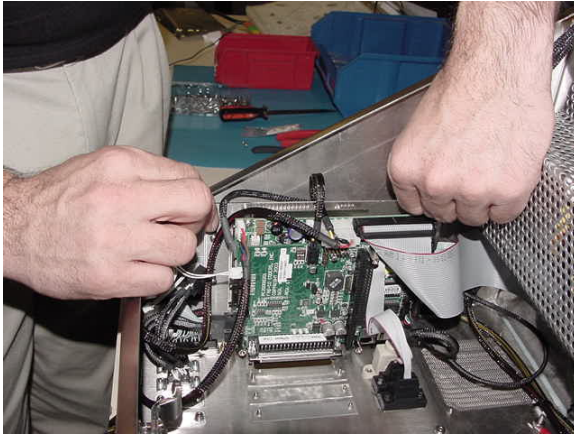


Figure 6: Lifting the PCB Plate

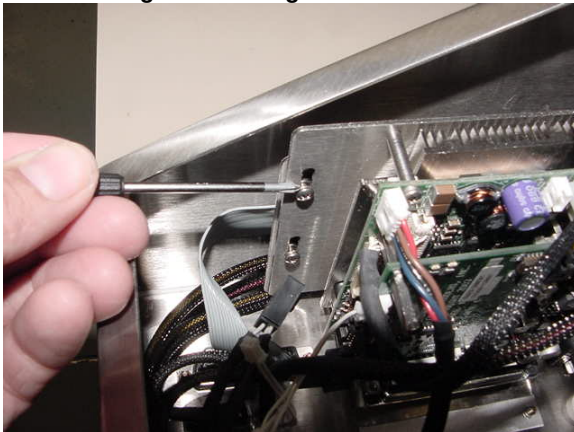


Figure 7: Tightening the PCB Plate Screws

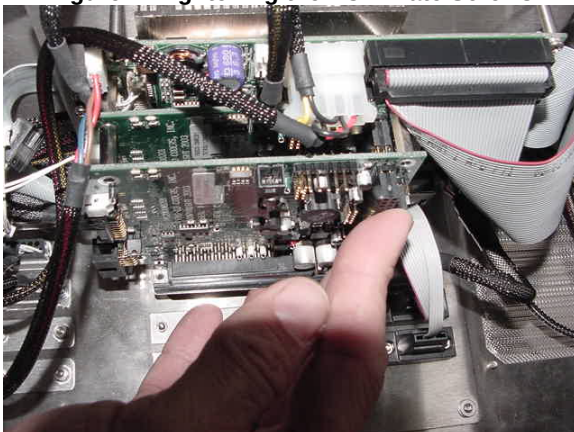


Figure 8: Installing the Driver Board

Step 5 Lifting the PCB Plate

11. Once all four screws are loose, lift the plate as shown until the plate moves to the top of the screw slots shown in previous Figure.

Step 6. Tightening the PCB plate screws.

12. Upon lifting the PCB mounting plate, re-tighten at least one screw to hold the plate into place so that the drive boards may be removed or installed.

Step 7. Installing the Driver Board

13. Line up the pins on the PC140 bus and push the driver board onto the board beneath it.

Image 4040

4. Controller

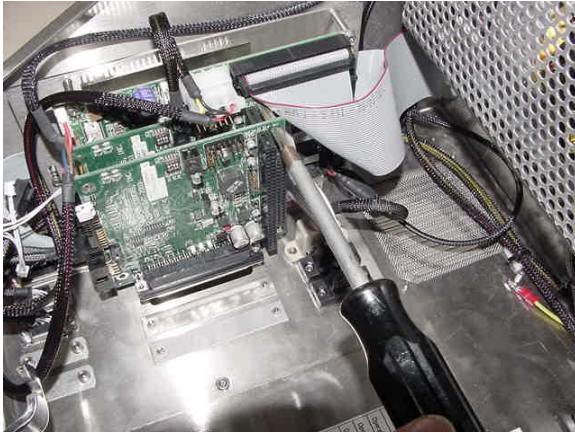


Figure 9: Securing Driver Board

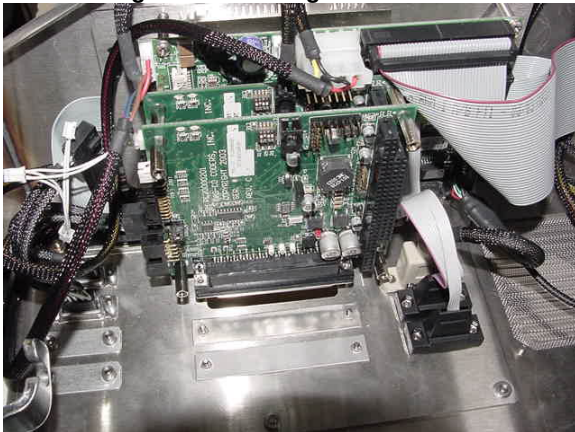


Figure 10: Driver Board Installed

Step 8. Securing Driver Board

14. Using the standoffs supplied with the driver board expansion kit, fasten each one loosely, and then tighten them once each screw has threaded in smoothly.

Step 9. Driver board Installed with Standoffs attached.

15. Your new driver board is now installed

Step 10, 11, 12. Securing PCB Plate

16. Repeat in reverse steps 6 then 5 then 4.

Image 4040

4. Controller



Troubleshooting

Symptom: No power upon startup

<u>Possible cause</u>	<u>Possible solution</u>
• Poor AC connection	Check AC connections
• Blown AC fuse	Check fuse
• UPS (Uninterruptible Power Supply) or Line conditioner not turned or defective	Check line conditioner power and connection if using a line conditioner. Try plugging printer directly into AC power to be sure UPS or line conditioner is OK.
• Problem at AC power source (wall outlet).	Check AC voltage at source, or try another source.

Symptom: Upon Power up, Fan comes on, but the display does not illuminate

<u>Possible cause</u>	<u>Possible solution</u>
• The Inverter cable is loose or disconnected.	Shine a flashlight onto the display to view if Windows can be seen on the display. If so, open the controller door and check the inverter cable connection at both ends. See wiring section.
• Display cable loose or disconnected.	Shine the flashlight onto the display. If Windows cannot be viewed, then the display is not functioning. Open the controller door and check the connection on the display cable at both the display side and the CPU board side.
• Inverter Bad	If inverter cables are connected ok, the inverter may need to be replaced.
• Display bad	If cable connections are all ok, replace the display.
• Bios Re-set (this can happen when the C-MOS battery dies)	If the BIOS becomes re-set, this is usually caused by a dead C-MOS battery. The CMOS battery has a life of about 5 years replace the battery, then attach an external CRT monitor to the video port, because the system has defaulted back to factory settings. You will need to re-set the bios settings so that your panel display will work. There is a BIOS Flash utility saved on the hard drive of the system for convenient re-load. If the re-load does not work, see the BIOS section of this manual for making BIOS adjustments.



Symptom: Photocell lights up but no print

<u>Possible cause</u>	<u>Possible solution</u>
The Print Speed and or Margin are set incorrectly	Run a piece of paper in front of the print head with one hand, and with the other hand trigger the photocell. If the printer prints, then you can determine if the printer is printing to early or too late. Adjust Margin and or print speed accordingly.
Product detect/encoder settings incorrect	Check that these settings match the hardware configuration. Ex. If using a PD but no Enc. Only PD should be enabled. Check that the linked/independent mode settings are correct according to hardware set up.
PD/Enc. Connector loose at Driver Board input	Open door and check that the connector is connected to driver board. <i>See wiring diagram.</i> To ensure PD signal, check that LED on driver board lights when PD is tripped. Also, check the Encoder LED. It should light when the encoder is connected and moving or at a resting state on a pulse. If both LED's light, connectivity is secure. If this symptom occurs on any head other than head 1, check that the linking cable is connected. <i>See wiring diagram.</i>

Symptom: In NJ Processor the Printhead Icon has an "X" through it.

<u>Possible cause</u>	<u>Possible solution</u>
DIP Switch on one of the Driver Boards set incorrectly	Check the dipswitch settings on the corresponding board(s) that are X'd out. If switch setting ok, board could be faulty.
Driver board not seated properly	Check that the Driver Board(s) is seated fully and that the pins are properly lined up. If correct, driver board could be faulty.
Defective Driver Board	Replace Driver Board

Symptom: Boot Failure/Boot Errors

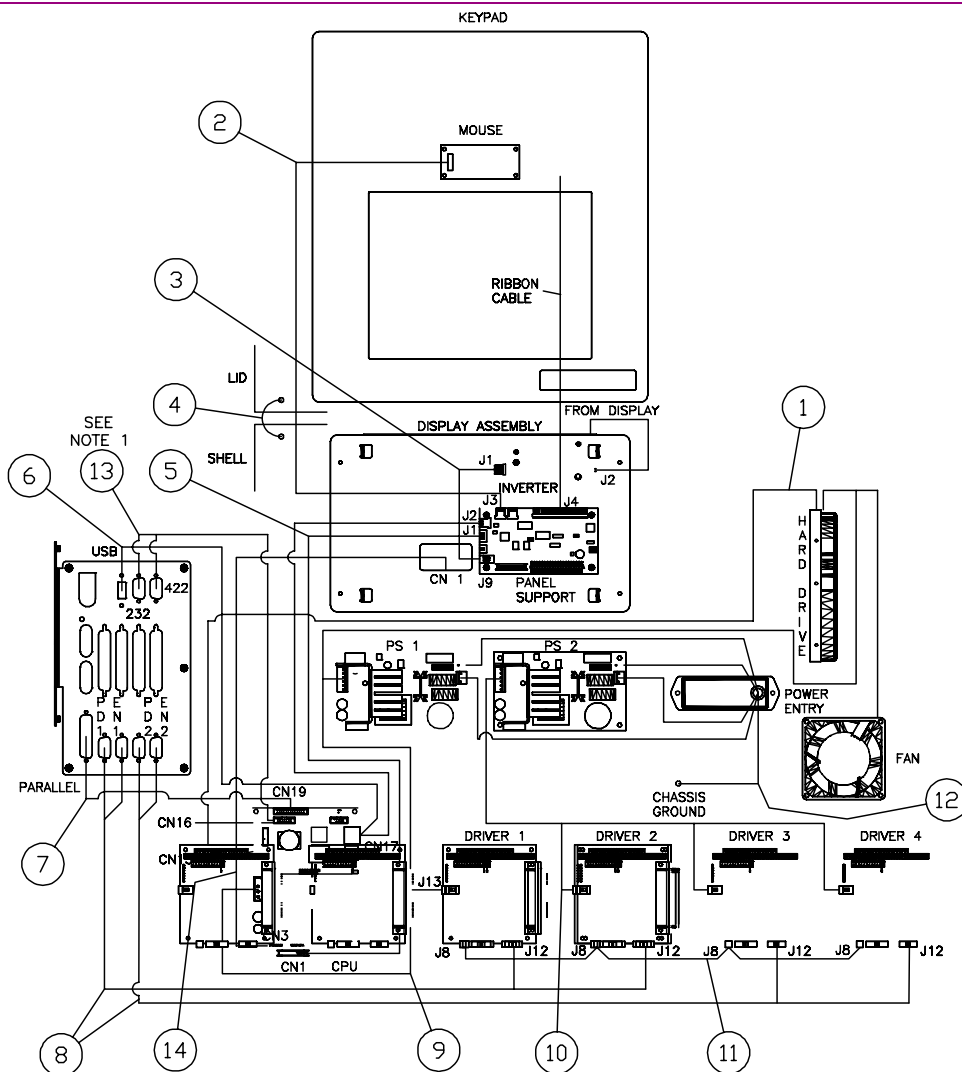
<u>Possible cause</u>	<u>Possible solution</u>
Hard drive cable disconnected.	*Often when a driver board is added, the technician disconnects the HD cable and then forgets to re-connect it. Re-connect it.
Hard Drive crashed	Replace hard drive
Memory Failure	Replace memory (RAM) module on CPU board
CPU Board Failure	Replace CPU board
BIOS Problem	See Technical Bulletin

Image 4040

4. Controller



Wiring Diagram



14	1	CH10000702	CABLE, LG PHILIPS DISPLAY, ASSEMBLY
13	1	CH10002001	CABLE, RS232/RS485/RS422
ITEM	QUANTITY	PART NUMBER	DESCRIPTION
ADDITIONAL CABLES TO BE USED ON ES20000101			
12	1	CH20001401	CABLE, POWER ENTRY, AC, UM3K
11	1	CH20002501	CABLE, LINKING
10	1	CH20001301	CABLE, POWER SUPPLY #2 DC OUT
9	1	CH20001601	CABLE, POWER SUPPLY #1
8	2	CH20002101	CABLE, PRODUCT DETECT, ENCODER
7	1	CH20002601	CABLE, RIBBON, PARALLEL
6	1	CH20001501	CABLE, PANEL SUPPORT TO USB, USB TO CHASSIS
5	1	CH20001801	CABLE, PANEL SUPPORT TO CPU
4	1	CH20002401	CABLE, GROUND, LID TO SHELL
3	1	CH20001701	CABLE, INVERTER BACKLIGHT TO PANEL SUPPORT
2	1	CH20002001	CABLE, MOUSE TO PANEL SUPPORT
1	1	CH20001901	CABLE, RIBBON, HARD DRIVE IDE TO CPU
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

NOTES:

- ITEM 13 COMES WITH CPU.
- ITEM 14 IS MADE BY ANOTHER VENDOR AND DOES NOT COME IN THIS ASSEMBLY.
- MARK KIT WITH UL CERTIFICATE.

Figure 11: Wiring Diagram (ES20000101)

Image 4040

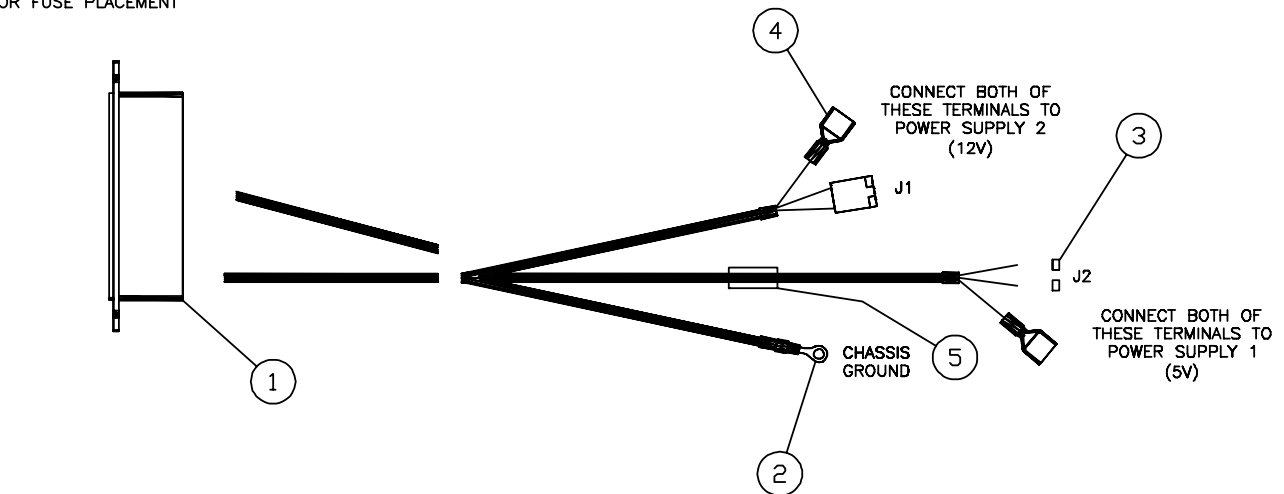
4. Controller



Power Entry

DO NOT INCLUDE FUSE WITH ASSEMBLY

REFER TO CH20001401 ASSEMBLY INSTRUCTION
FOR FUSE PLACEMENT



3	22	BLACK	3
2	22	N/C	2
1	22	WHITE	1
J1	GAGE	WIRE COLOR	J2

CONNECTOR AND WIRE LEGEND

CH10001402	1	14 3/4"
CH10001402	1	10 3/4"
CH10001402	1	6 3/4"
PART NUMBER	QUANTITY	LENGTH

EXPANDABLE SLEEVING

CH10001502	1	15 3/4 X 1/8 X 1/4	BLACK
CH10001502	1	11 1/4 X 1/8 X 1/4	BLACK
PART NUMBER	QUANTITY	LENGTH	WIRE COLOR

WIRE LENGTH AND QUANTITY

CH10001504	1	15 3/4 X 1/8 X 1/4	WHITE
CH10001504	1	11 1/4 X 1/8 X 1/4	WHITE
PART NUMBER	QUANTITY	LENGTH	WIRE COLOR

WIRE LENGTH AND QUANTITY

CH10001508	1	15 3/4 X 5/16 X 1/4	GREEN
CH10001508	2	11 3/4 X 5/16 X 1/4	GREEN
PART NUMBER	QUANTITY	LENGTH	WIRE COLOR

WIRE LENGTH AND QUANTITY

5	1	MP10006801	LABEL, SELF LAMINATING VINYL
4	2	CN10001901	RECEPTACLE ASSEMBLY, .250 SERIES
3	2	CN10001801	HOUSING, MOLEX, 3 CIRCUITS
2	1	CN10001601	TERMINAL, RING, #6 CRIMP
1	1	CN10001701	MODULE, POWER ENTRY
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

CONNECTION NOTES:

THIS CABLE CONNECTS TO:

5V AND 12V POWER SUPPLY AND TO CHASSIS GROUND.

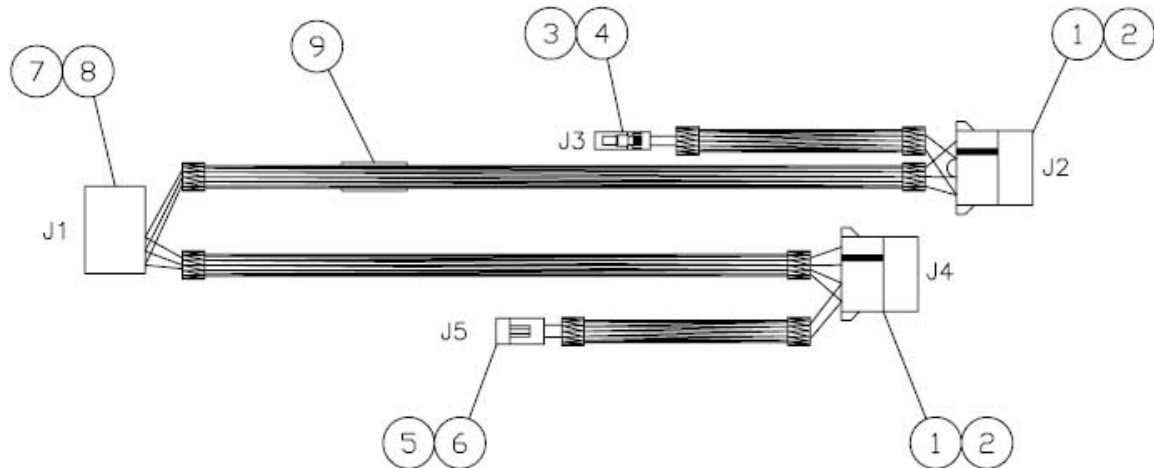
Figure 12: Power Entry (CH20001401)

Image 4040

4. Controller



Power Supply 1



CH10001203	8	5/8"
PART NUMBER	QUANTITY	LENGTH
3/16" HEAT SHRINK TUBING		

CH10001402	1	29 1/4"
CH10001402	1	27"
CH10001402	1	4"
CH10001402	1	3"
PART NUMBER	QUANTITY	LENGTH
EXPANDABLE SLEEVING		

9	1	MP10006801	LABEL, SELF LAMINATING VINYL
8	2	CN10001401	TERMINAL, CRIMP
7	1	CN10001501	HOUSING, MOLEX, 6 CIRCUITS
6	2	CN10002601	TERMINAL, CRIMP
5	1	CN10000701	2 PIN CONNECTOR TO WIRING
4	2	CN10002701	TERMINAL, CRIMP
3	1	CN10000601	HOUSING, CONNECTOR, 2 CIRCUIT
2	8	CN10002801	SOCKET, MATE-N-LOK
1	2	CN10002301	PLUG, 4 CIRCUIT, MATE-N-LOCK
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

PROPRIETARY NOTICE

5	22	BLACK	2, 3	2		
5	22	BLACK			3	
4	22	BLACK			2	2
3	22	RED			4	
2	22	RED	4			
1	22	YELLOW	1	1		
1	22	YELLOW			1	1
J1	GAGE	WIRE COLOR	J2	J3	J4	J5
CONNECTOR AND WIRE LEGEND						

CONNECTION NOTES:

THIS CABLE CONNECTS TO:

POWER SUPPLY 5V TO HARD DRIVE TO FAN 12V
TO CPU TO DRIVER BOARD.

CH10001503	1	30 X 1/8 X 1/8	YELLOW
CH10001503	1	29 X 1/8 X 1/8	YELLOW
CH10001503	1	5 X 1/8 X 1/8	YELLOW
CH10001503	1	4 X 1/8 X 1/8	YELLOW
CH10001502	2	30 3/4 X 1/8 X 1/8	BLACK
CH10001502	2	29 X 1/8 X 1/8	BLACK
CH10001502	1	5 X 1/8 X 1/8	BLACK
CH10001502	1	4 X 1/8 X 1/8	BLACK
CH10001501	1	30 3/4 X 1/8 X 1/8	RED
CH10001501	1	29 X 1/8 X 1/8	RED
PART NUMBER	QUANTITY	LENGTH	WIRE COLOR
WIRE LENGTH AND QUANTITY			

Figure 13: Power Supply 1 (CH20001601)

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4. Controller



Power Supply 2

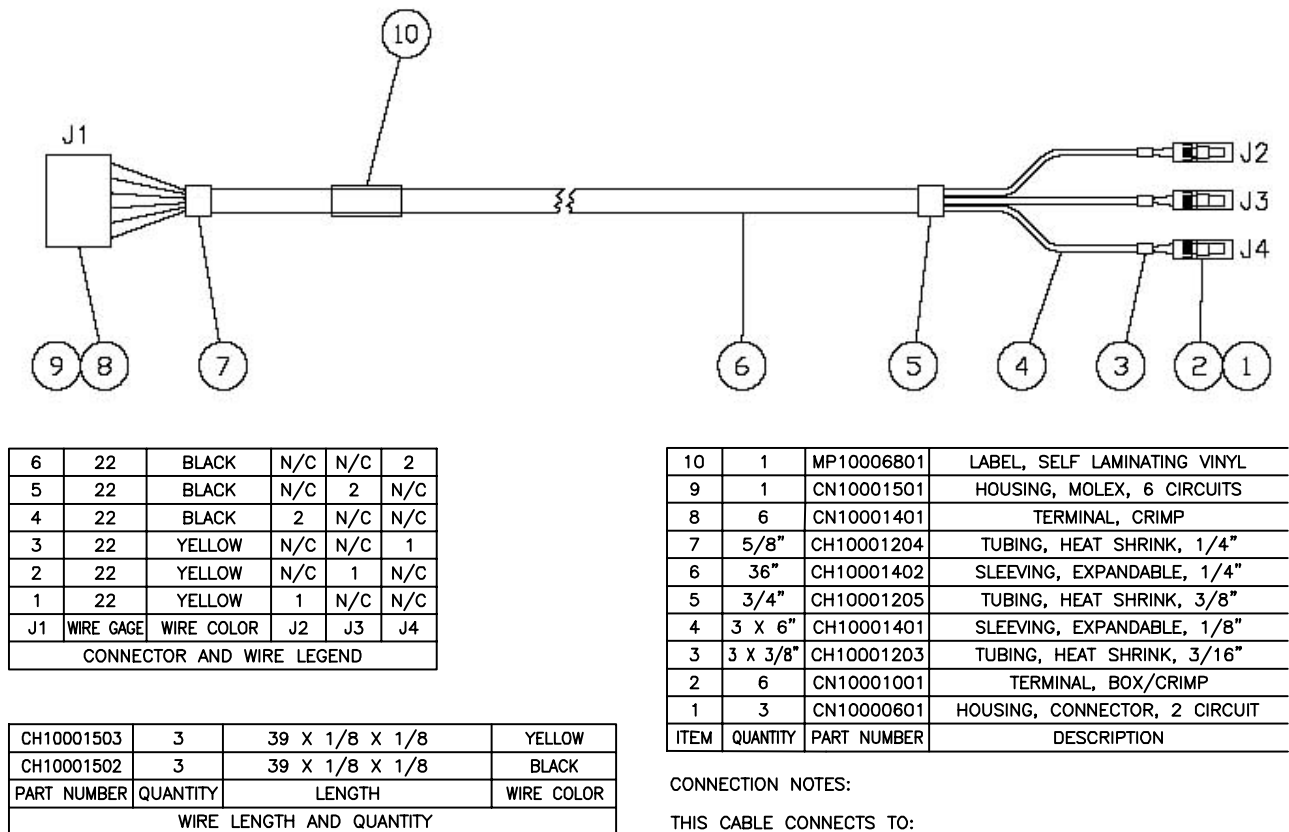


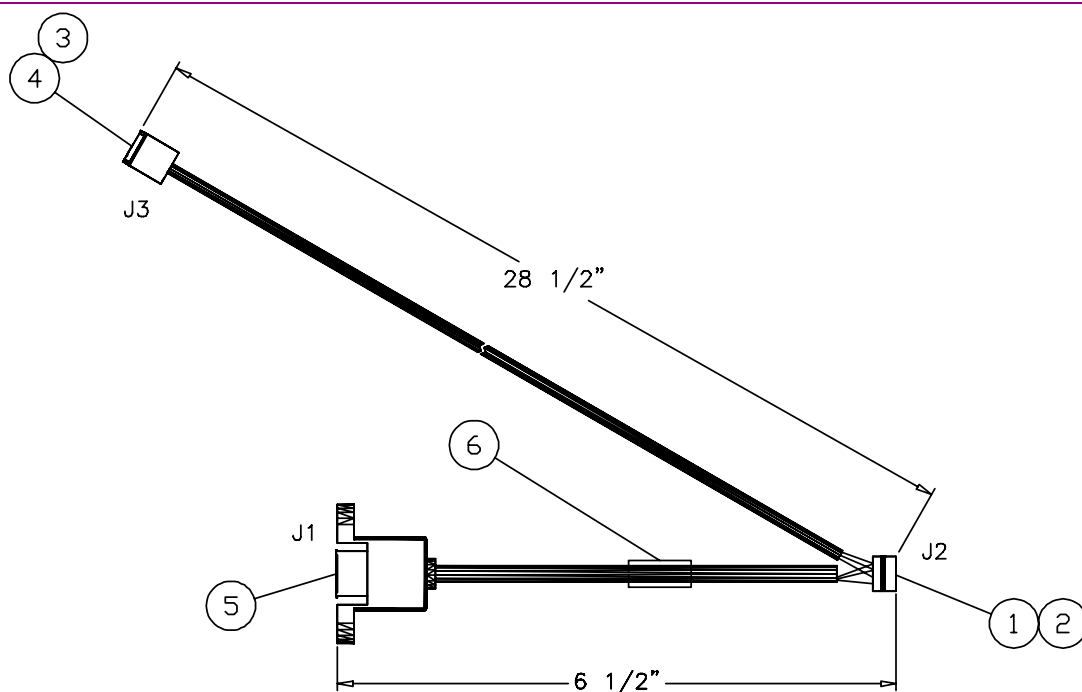
Figure 14: Power Supply 2 (CH20001301)

Image 4040

4. Controller



USB



SHEILD	24	HEAT SHRINK	9	
1	24	BLACK	8	
	24	VIOLET	7	1
2	24	GREEN	6	
	24	BROWN	5	2
3	24	WHITE	4	
	24	WHITE	3	3
4	24	RED	2	
J1	GAGE	WIRE COLOR	J2	J3

CONNECTOR AND WIRE LEGEND

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
6	1	MP10006801	LABEL, SELF LAMINATING VINYL
5	1	CN10002201	ADAPTER, 5 PIN MOTHERBOARD
4	3	CN10003401	TERMINAL, CRIMP
3	1	CN10002101	HOUSING, CST-100
2	6	CN10004301	TERMINAL, CRIMP
1	1	CN10002001	2MM GRID, WIRE TO BOARD CONNECTOR, CRIMP RECEPTACLE HOUSING

PART NUMBER	QUANTITY	LENGTH
CH10001203	3	5/8"

3/16" HEAT SHRINK TUBING

PART NUMBER	QUANTITY	LENGTH
CH10001401	1	28"

EXPANDABLE SLEEVE

PART NUMBER	QUANTITY	LENGTH
CH10001402	1	5"

EXPANDABLE SLEEVE

PART NUMBER	QUANTITY	LENGTH	WIRE COLOR
CH10001705	1	28 X 1/8 X 1/16	BROWN
CH10001704	1	28 X 1/8 X 1/16	VIOLET
CH10001701	1	28 X 1/8 X 1/16	WHITE

WIRE LENGTH AND QUANTITY

CONNECTION NOTES:

THIS CABLE CONNECTS TO:

PANEL SUPPORT (J2) TO USB, USB CHASSIS.

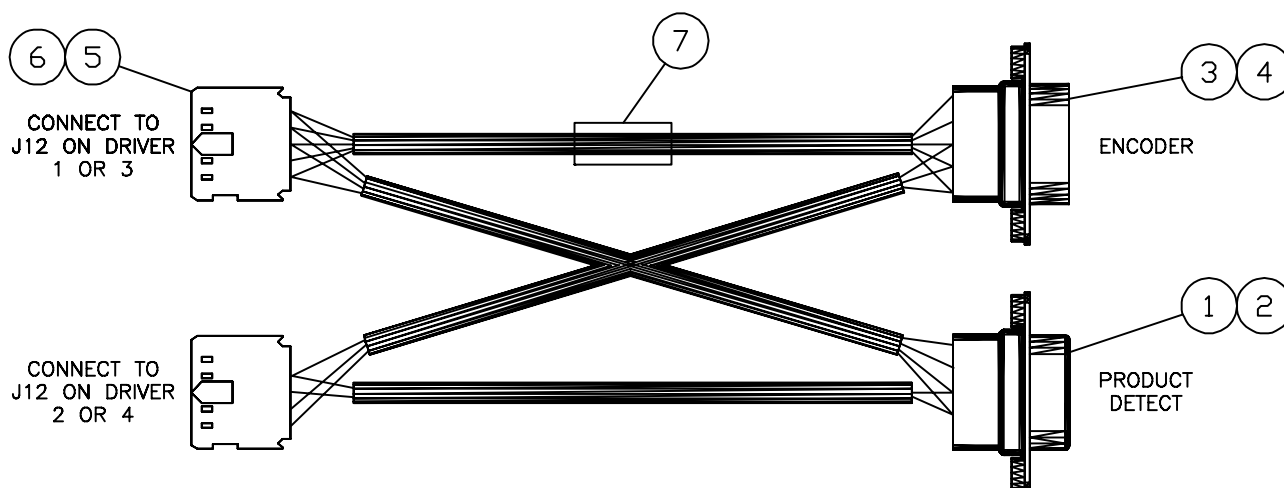
Figure 15: USB (CH20001501)

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4. Controller



Product Detect, Encoder



9	GND	9	GND	5	GND
7	ECIN-	7	ECIN-	4	ECIN-
5	ECIN+	5	ECIN+	3	ECIN+
3	VCCF			2	VCCF
1	+12VF			1	+12VF
PIN	NAME	PIN	NAME	PIN	NAME
PC20000201		PC20000201		ENCODER	
#1 CONNECTOR		#2 CONNECTOR		CONNECTOR	
10 PIN		10 PIN		DB9	
HEADER		HEADER		PLUG	

CONNECTOR LEGEND

7	1	MP10006801	LABEL, SELF LAMINATING VINYL
6	X	CN10003601	MOD IV CRIMP SNAP IN
5	2	CN10003501	HOUSING, CRIMP SNAP-IN SHORT ENTRY
4	X	CN10004001	D-SUB MALE CRIMP PIN
3	1	CN10003801	PLUG, DB9
2	X	CN10003901	D-SUB FEMALE CRIMP PIN
1	1	CN10003701	RECEPTACLE, DB9
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

PROPRIETARY NOTICE:

8	GND	8	GND	5	GND
6	PDIN	6	PDIN	3	PDIN
4	VCCF			2	VCCF
2	+12VF			1	+12VF
PIN	NAME	PIN	NAME	PIN	NAME
PC20000201		PC20000201		PRODUCT	
#1 CONNECTOR		#2 CONNECTOR		DETECTOR	
10 PIN		10 PIN		CONNECTOR	
HEADER		HEADER		DB9 SOCKET	

CONNECTOR LEGEND

CONNECTION NOTES:

THIS CABLE CONNECTS TO:

PRODUCT DETECT, ENCODER TO DRIVER BOARD.

CH10001401	4	3 3/8"
PART NUMBER	QUANTITY	LENGTH
EXPANDABLE SLEEVING		

CH10001701	14	4 1/2 X 1/8 X 5/32	WHITE
PART NUMBER	QUANTITY	LENGTH	WIRE COLOR
WIRE LENGTH AND QUANTITY			

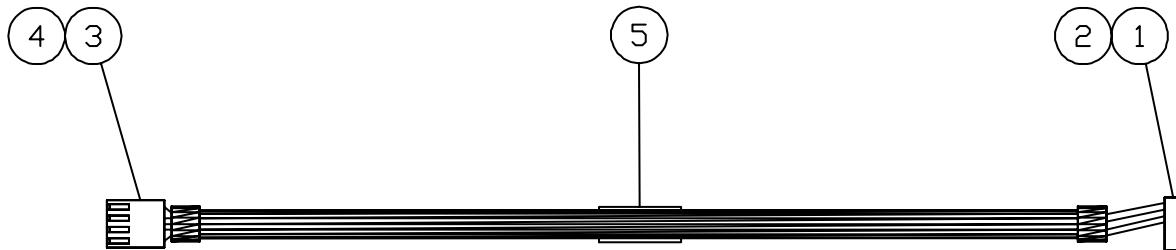
Figure 16: Product Detect: Encoder (CH20002102)

Image 4040

4. Controller



Mouse to Panel Support



		N/C	8
		N/C	7
		N/C	6
		N/C	5
4	22	VIOLET	1
3	22	BROWN	2
2	22	WHITE	3
1	22	YELLOW	4
J1	WIRE GAGE	WIRE COLOR	J2
CONNECTOR AND WIRE LEGEND			

5	1	MP10006801	LABEL, SELF LAMINATING VINYL
4	4	CN10003401	TERMINAL, CRIMP
3	1	CN10002101	HOUSING, CST-100
2	4	CN10003301	TERMINAL, BOX/CRIMP
1	1	CN10003201	HOUSING, RECEPTACLE, WIRE TO BOARD CONNECTOR
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

CH10001203	2	5/8"
PART NUMBER	QUANTITY	LENGTH
3/16" HEAT SHRINK TUBING		

CH10001402	1	7"
PART NUMBER	QUANTITY	LENGTH
EXPANDABLE SLEEVING		

CH10001507	1	8 1/4 X 1/16 X 1/6	VIOLET
CH10001506	1	8 1/4 X 1/16 X 1/6	BROWN
CH10001504	1	8 1/4 X 1/16 X 1/6	WHITE
CH10001503	1	8 1/4 X 1/16 X 1/6	YELLOW
PART NUMBER	QUANTITY	LENGTH	WIRE COLOR
WIRE LENGTH AND QUANTITY			

CONNECTION NOTES:

THIS CABLE CONNECTS TO:

MOUSE (J2) TO PANEL SUPPORT (J3).

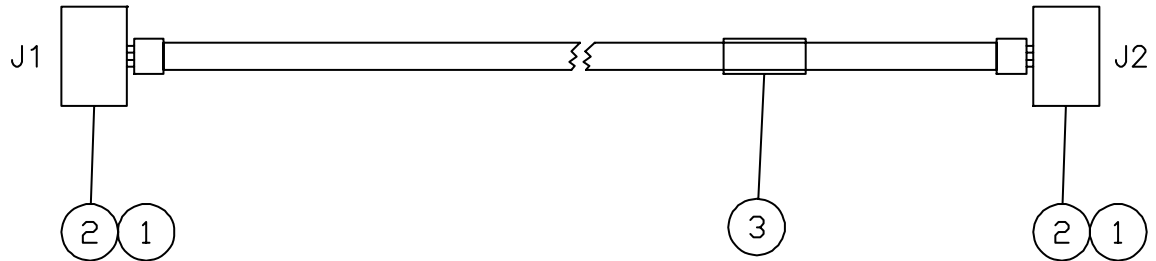
Figure 17: Mouse to Panel Support (CH20002001)

Image 4040

4. Controller



Panel Support to CPU



5	22	RED	5
4		N/C	4
3	22	BROWN	3
2	22	BLACK	2
1	22	BLUE	1
J1	WIRE GAGE	WIRE COLOR	J2
CONNECTOR AND WIRE LEGEND			

3	1	MP10006801	LABEL, SELF LAMINATING VINYL
2	1	CN10003001	TERMINAL, PH, DISCONNECTABLE CRIMP STYLE
1	2	CN10002901	CONNECTOR, PH, DISCONNECTABLE CRIMP STYLE
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

CH10001203	2	5/8"
PART NUMBER	QUANTITY	LENGTH
3/16" HEAT SHRINK TUBING		

CH10001402	1	37"
PART NUMBER	QUANTITY	LENGTH
EXPANDABLE SLEEVING		

CH10001001	1	38 X 1/16 X 1/6	BLUE
CH10000901	1	38 X 1/16 X 1/6	BLACK
CH10001601	1	38 X 1/16 X 1/6	BROWN
CH10000801	1	38 X 1/16 X 1/6	RED
PART NUMBER	QUANTITY	LENGTH	WIRE COLOR
WIRE LENGTH AND QUANTITY			

CONNECTION NOTES:

THIS CABLE CONNECTS TO:

PANEL SUPPORT (J1) TO CPU (CN1)

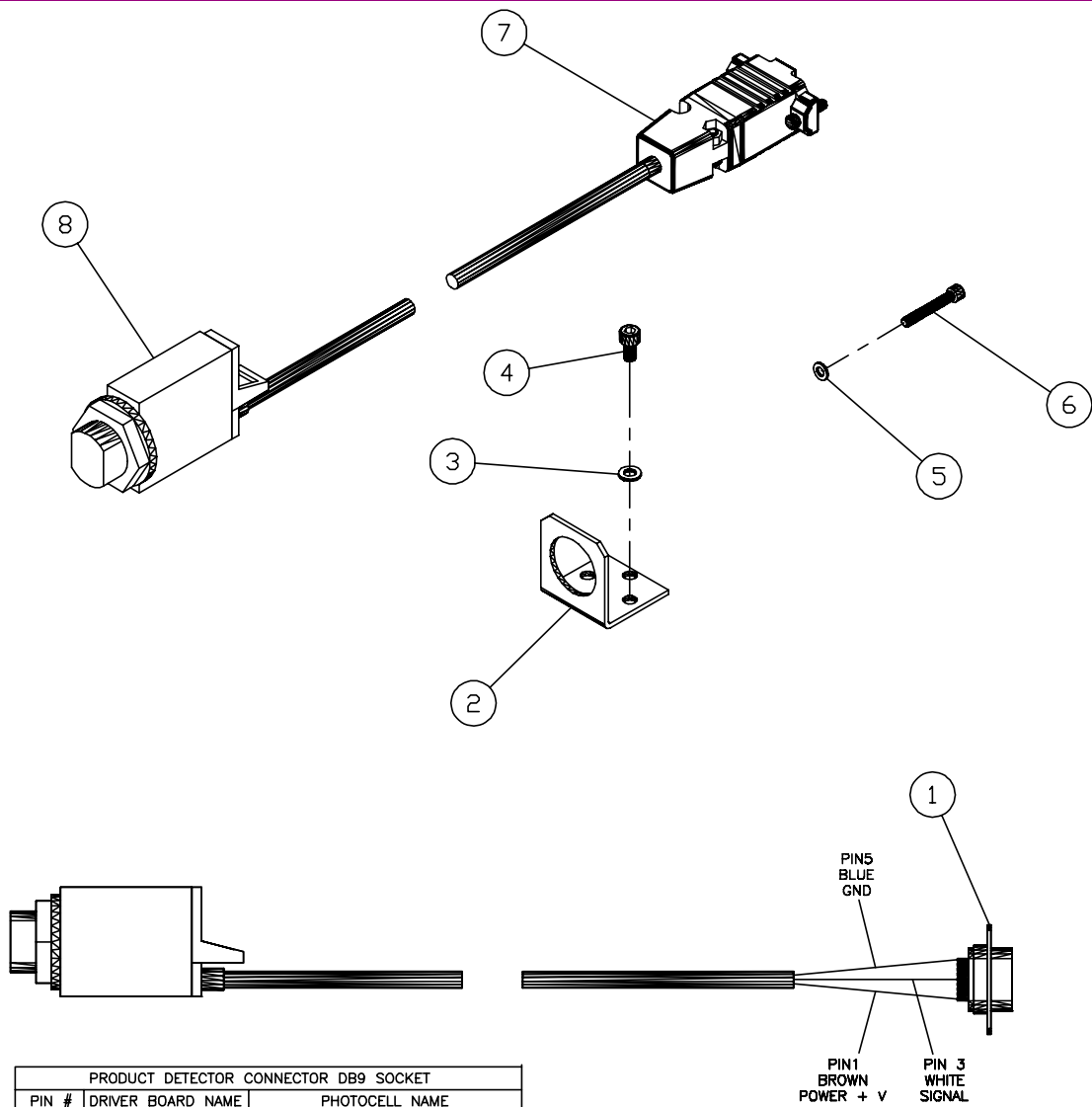
Figure 18: Panel Support to CPU (CH20001801)

Image 4040

4. Controller



Photocell



PRODUCT DETECTOR CONNECTOR DB9 SOCKET			
PIN #	DRIVER BOARD NAME		PHOTOCELL NAME
1	+12VF		POWER +V (+12VDC)
2	VCCF		—
3	PDIN		NPN OPEN COLLECTOR
5	GND		—(GND OR COMMON)
8	1	BJ-253	PHOTOCELL
7	1	BJ-235	HOOD, 9 PIN D SUB
6	1	F010440075	SCREW, 4—40 X 3/4, SHC
5	1	F090400000	LOCK WASHER, #4
4	2	F010632025	SCREW, 6—32 X 1/4, SHC
3	2	F090600000	LOCK WASHER, #6
2	1	FM10010301	BRACKET, PHOTOCELL
1	1	BJ-234	CONNECTOR, D SUB, 9 PIN, SOLDER CUP
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

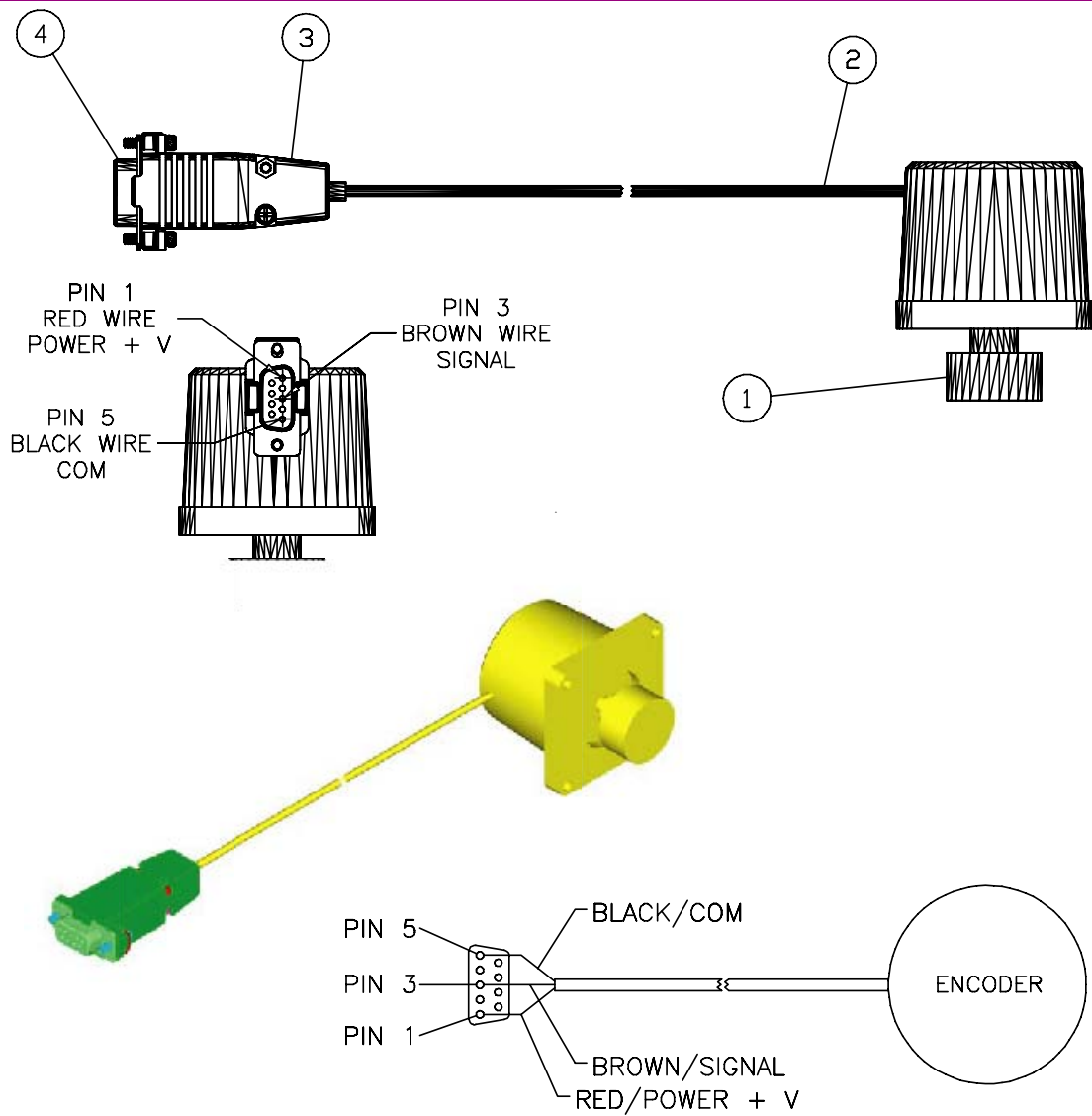
Figure 19: Photocell (SS10000401)

Image 4040

4. Controller



Encoder



ENCODER CONNECTOR DB9 PLUG			
PIN #	DRIVER BOARD NAME	ENCODER NAME	
1	+12VF	POWER +V (+12VDC)	
2	VCCF	-	
3	ECIN+	SIGNAL +A	
4	ECIN-	SIGNAL -A (differential encoder only)	
5	GND	COMMON	

4	1	BJ-233	CONNECTOR, D SUB, 9 PIN, SOLDER CUP
3	1	BJ-235	HOOD, 9 PIN D SUB
2	1	BJ-4605	ENCODER
1	1	BJ-4933	WHEEL, ENCODER
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

ELECTRICAL SCHEMATIC OF ASSEMBLY

Figure 20: Encoder (SS10000501)

Technical Manual Image 4040.doc

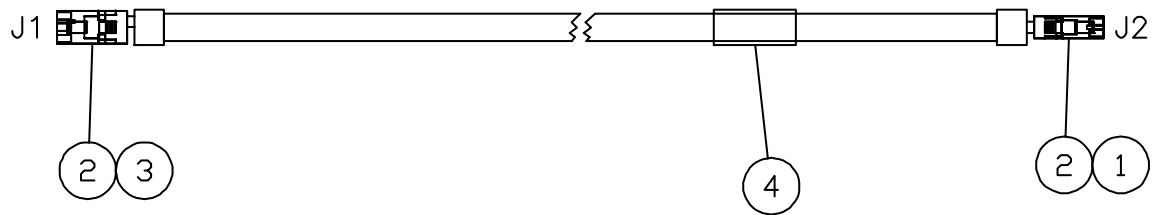


Image 4040

4. Controller



Inverter to Panel Support



4		N/C	
3		N/C	
2	22	BLACK	2
1	22	RED	1
J1	WIRE GAGE	WIRE COLOR	J2
CONNECTOR AND WIRE LEGEND			

4	1	MP10006801	LABEL, SELF LAMINATING VINYL
3	1	CN10000602	HOUSING, CONNECTOR, 3 CIRCUIT
2	5	CN10001001	TERMINAL, BOX/CRIMP
1	1	CN10000601	HOUSING, CONNECTOR, 2 CIRCUIT
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

CH10001203	2	1/2"
PART NUMBER	QUANTITY	LENGTH
3/16" HEAT SHRINK TUBING		

CH10001402	1	9 3/4"
PART NUMBER	QUANTITY	LENGTH
EXPANDABLE SLEEVING		

CH10000901	1	11 X 1/8 X 1/8	BLACK
CH10000801	1	11 X 1/8 X 1/8	RED
PART NUMBER	QUANTITY	LENGTH	WIRE COLOR
WIRE LENGTH AND QUANTITY			

CONNECTION NOTES:

THIS CABLE CONNECTS TO:

INVERTER BACKLIGHT (J1) TO PANEL SUPPORT (J9)

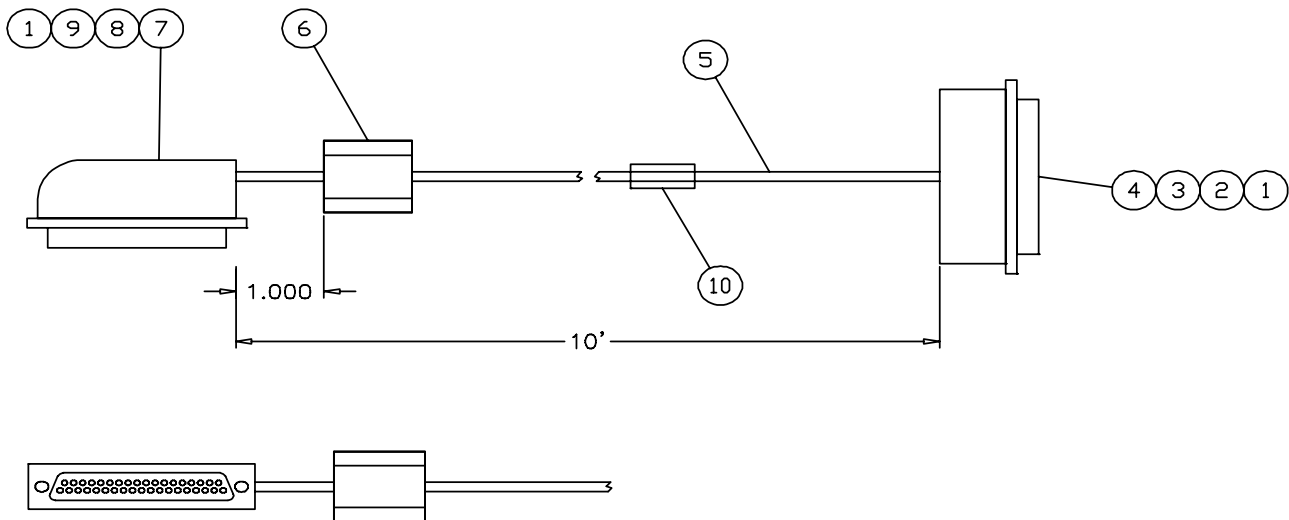
Figure 21: Inverter to Panel Support (CH20001701)

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4. Controller



Controller to Print Module



NOTES:

1. 10' CABLE ASSEMBLY CONNECTS IDS2/128 AND IDS2/500 PRINT MODULE'S TO UM3K CONTROLLER.

10	1	MP10006801	LABEL, SELF LAMINATING VINYL
9	1	CN10004601	BACKSHELL, 40"
8	37	CN10003902	D-SUB MALE CRIMP PIN
7	1	CN10004501	CONNECTOR, DB37, MALE
6	1	MP10007101	FERRITE
5	122"	CH10002101	CABLE, 24 GAGE
4	1	CN10004701	BACKSHELL
3	37	CN10003901	CRIMP PIN, D-SUB FEMALE
2	1	CN10004401	CONNECTOR, DB37, FEMALE
1	4	MP10007201	JACKSCREW, EXTENDED
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

Figure 22: Controller to Print Module (CH20000701)

Image 4040

4. Controller



Schematic, I/O, Driver Board

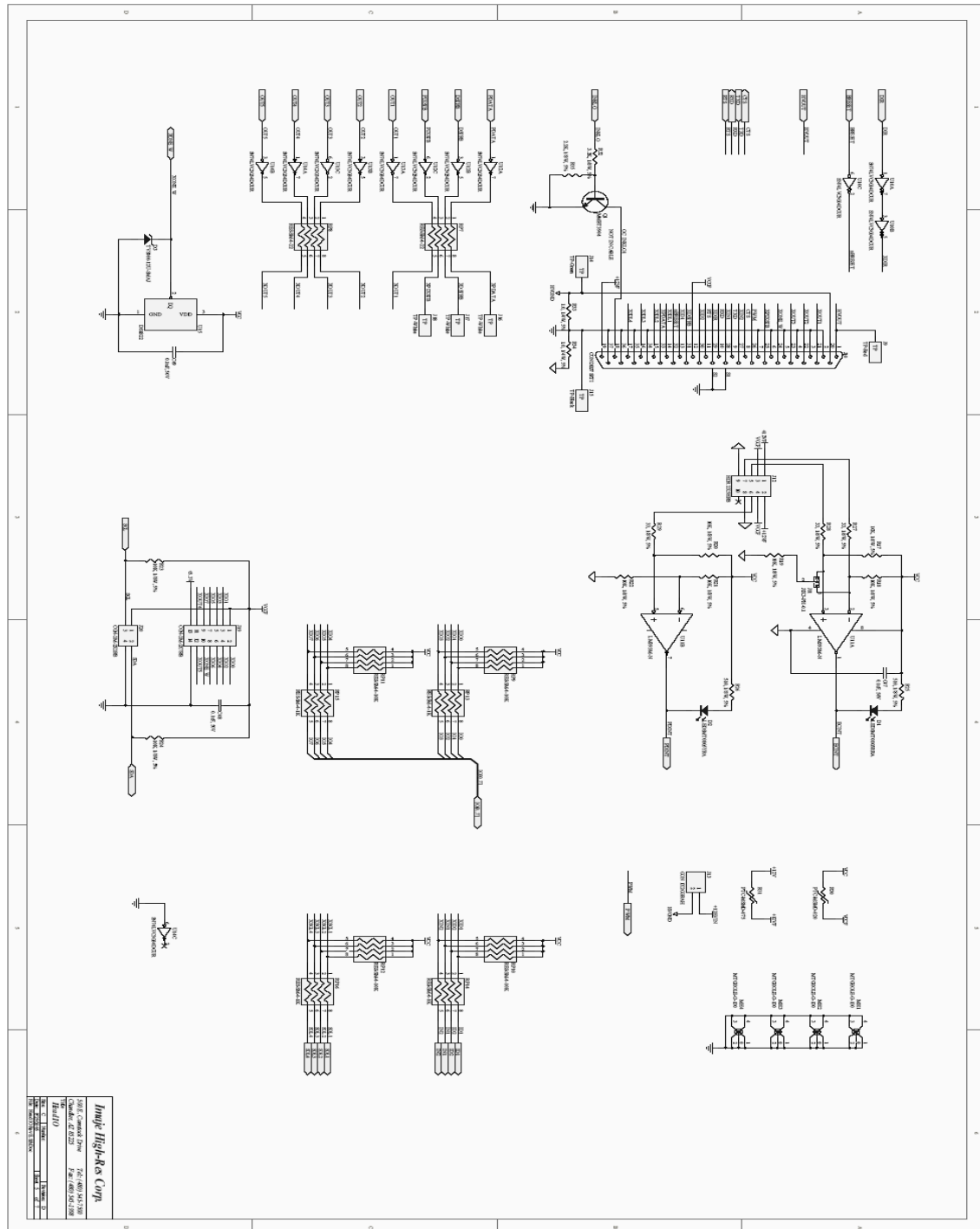


Figure 23: Schematic, I/O, Driver Board

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4. Controller



Panel Support Board Schematic, I/O, Overview

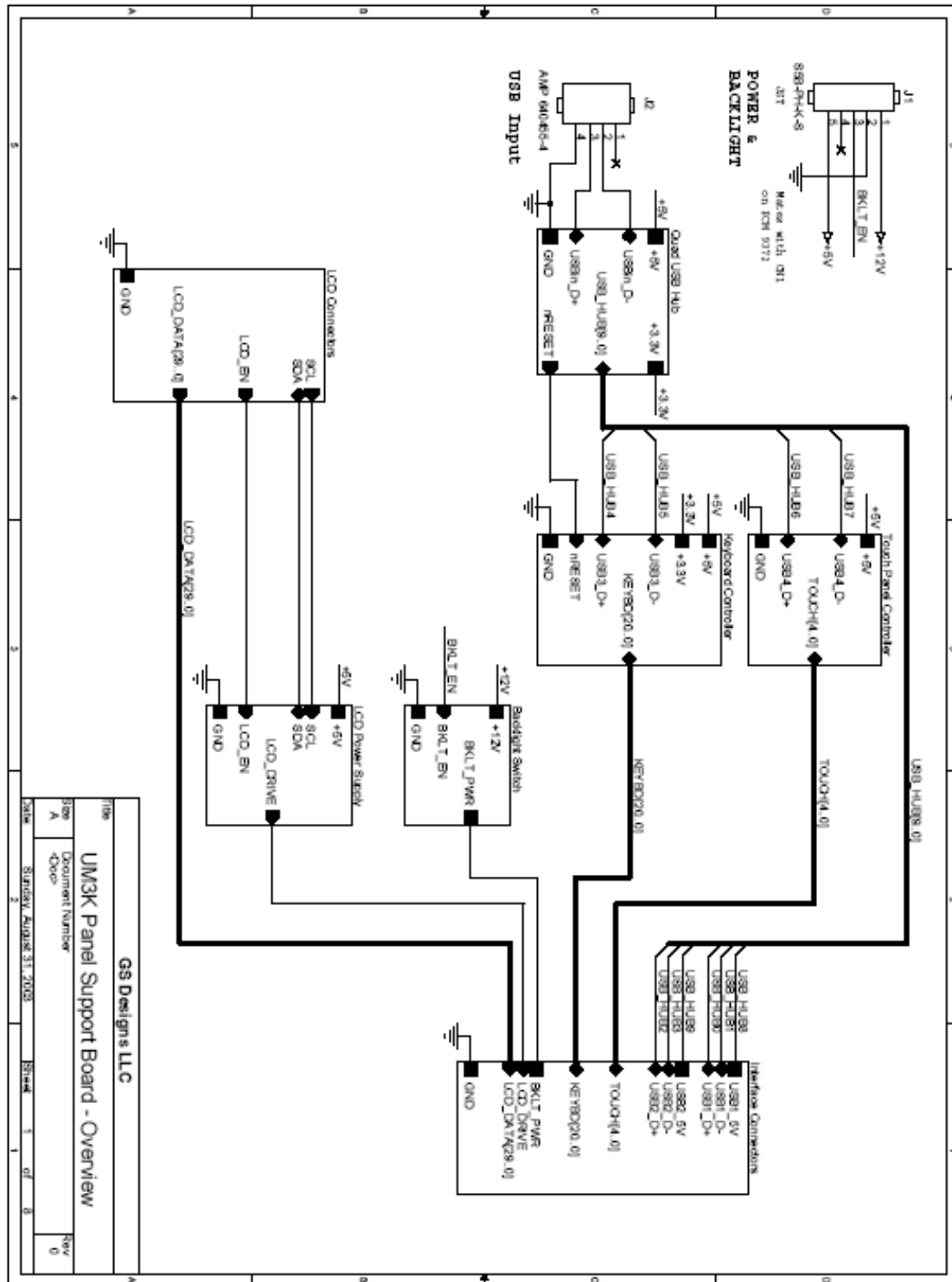


Figure 24: Panel Support Board Schematic, I/O, Overview

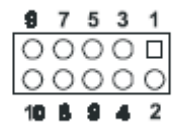


Ethernet 10/100Base-T Connector (CN15)

Table 1: Ethernet 10/100Base-T connector (CN15)	
Pin	Signal
1	XMT+
2	XMT-
3	RCV+
4	N/C
5	N/C
6	RCV-
7	N/C
8	N/C

Audio Connector (CN14)

Table 2: Audio Connector			
Pin	Signal	Pin	Signal
1	LINE OUT R	2	LINE IN R
3	GND	4	GND
5	LINE OUT L	6	LINE IN L
7	GND	8	GND
9	MIC IN	10	RESERVED FOR MIC 2



Main Power Connector (CN9)

Table 3: Main Power Connector (CN9)	
Pin	Signal
1	+12V
2	GND
3	GND
4	+5V



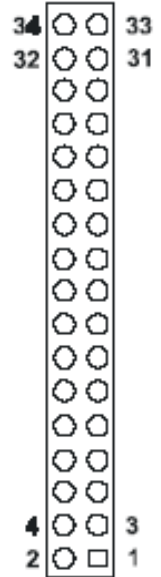
Keyboard and PS/2 Mouse Connector (CN12)

Table 4: Keyboard and Mouse Connector (CN12)	
Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK



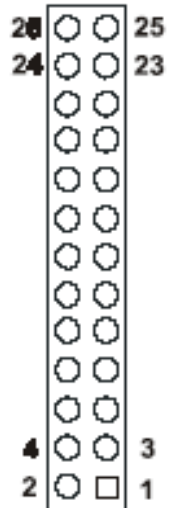
Floppy Disk Drive Connector (CN20)

Table 5: Floppy Disk Drive Connector (CN20)			
Pin	Signal	Pin	Signal
1	GND	2	DENSITY SELECT
3	GND	4	N/C
5	GND	6	DRIVE TYPE
7	GND	8	INDEX*
9	GND	10	MOTER O*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTER 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*
*Low Active			



Parallel Port Connector (CN19)

Table 7: Parallel Port Connector (CN19)			
Pin	Signal	Pin	Signal
1	STROBE*	2	AUTOFD*
3	D0	4	ERR
5	D1	6	INIT*
7	D2	8	SLCTINI*
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	ACK*	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	N/C
*Low Active			





IDE Hard Drive Connector (CN13)

Table 6: IDE Hard Drive Connector (CN13)			
Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	HDD 0	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	HD READY	28	N/C
29	HDACK 0*	30	GND
31	IRQ14	32	N/C
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DRIVE SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE	40	GND

*Low Active

Power and HDD LED Connector (CN11)

Table 8: Power and HDD LED Connector (CN11)	
Pin	Signal
1	+5V
2	GND
3	Power LED+ (+5V)
4	Power LED- (GND)
5	HDD LED +
6	HDD LED -

USB Connector (CN17)

Table 9: USB Connector (CN17)			
Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	UV-	4	UV-
5	UV+	6	UV+
7	GND	8	GND
9	Chassis GND	10	N/C

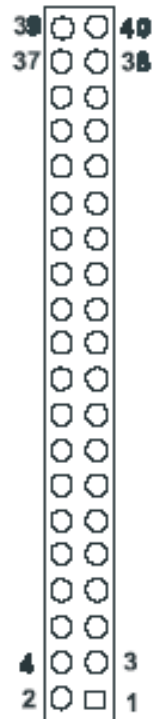


COM2 RS-232/422/485 Series Port (CN16)

Table 17: COM2 RS-232/422/485 Series Port (CN16)			
Pin	RS-232 Port	RS-422 Port	RS-485 Port
1	DCD	N/C	N/C
2	DSR	N/C	N/C
3	RXD	N/C	N/C
4	RTS	N/C	N/C
5	TxD	N/C	N/C
6	CTS	N/C	N/C
7	DTR	N/C	N/C
8	RI	N/C	N/C
9	GND	N/C	N/C
10	GND	N/C	N/C
11	N/C	TxD+	DATA+
12	N/C	TxD-	DATA-
13	N/C	RxD+	N/C
14	N/C	RxD-	N/C

Flat Panel Connector (CN2)

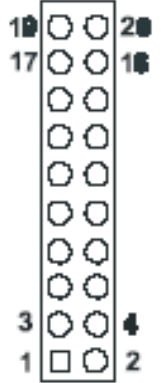
Table 12: Flat Panel Connector (CN2)			
Pin	Signal	Pin	Signal
1	VDDSAFES5 (+5V output)	2	VDDSAFE5 (+5V output)
3	GND	4	GND
5	VDDSAFES3 (+3.3V output)	6	VDDSAFE3 (+3.3V output)
7	N/C	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHFCLK	36	FLM
37	M/DE	38	LP
39	N/C	40	ENAVEE





External Flat Panel Display Connector (CN4)

Table 13: External Flat Panel Display Connector (CN4)			
Pin	Signal	Pin	Signal
1	GND	2	GND
3	P24	4	P25
5	P26	6	P27
7	P28	8	P29
9	P30	10	P31
11	P32	12	P33
13	P34	14	P35
15	GND	16	GND
17	N/C	18	N/C
19	N/C	20	N/C



Compact Flash Card Connector (CN21)

Table 14: Compact Flash Card Connector (CN21)			
Pin	Signal	Pin	Signal
1	GND	2	D03
3	D04	4	D05
5	D06	6	D07
7	*CS0	8	A10
9	*ATA SEL	10	A09
11	A08	12	A07
13	+5V	14	A06
15	A05	16	A04
17	A03	18	A02
19	A01	20	A00
21	D00	22	D01
23	D02	24	-IOCS16
25	*CD2	26	-CD1
27	D11	28	D12
29	D13	30	D14
31	D15	32	-CS1
33	*VS1	34	-IORD
35	*IOWR	36	-WE
37	INTRQ	38	+5V
39	*CSEL	40	-VS2
41	*RESER	42	IORDY
43	*INPACK	44	-REG
45	*DASP	46	-PDIAG
47	D08	48	D09
49	D10	50	GND

*Low Active



Peripheral Power Connector (CN10)

Table 15: Peripheral Power Connector (CN10)		
Pin	Signal	
1	-5V	
2	GND	
3	-12V	

COM1 RS-232 Serial Port (CN8)

Table 16: COM1 RS-232 Serial Port (CN8)	
Pin	Signal
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

LCD Inverter Backlight Connector (CN1)

Table 10: LCD Inverter Backlight Connector (CN1)		
Pin	Signal	
1	+12V	
2	GND	
3	ENABKL	
4	VBR	
5	+5V	

CRT Display Connector (CN5)

Table 11: CRT Display Connector (CN5)			
Pin	Signal	Pin	Signal
1	Red	9	VDDC
2	Green	10	GND
3	Blue	11	N/C
4	N/C	12	DDCSDA
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	DDCSCL
8	GND		



LCD Signal Mapping

Table 18: LCD Signal Mapping					
Pin Name	16-Bit DSTN	24-Bit DSTN	18-Bit TFT	24-Bit TFT	36-Bit TFT
PD0		LB3		B0	R00
PD1		LB2		B1	R10
PD2	LB1	LB1	B0	B2	R01
PD3	LB0	LB0	B1	B3	R11
PD4		UB3	B2	B4	R02
PD5		UB2	B3	B5	R12
PD6	UB1	UB1	B4	B6	R03
PD7	UB0	UB0	B5	B7	R13
PD8		LG3		G0	R04
PD9	LG2	LG2		G1	R14
PD10	LG1	LG1	G0	G2	R05
PD11	LG0	LG0	G1	G3	R15
PD12		UG3	G2	G4	G00
PD13	UG2	UG2	G3	G5	G10
PD14	UG1	UG1	G4	G6	G01
PD15	UG0	UG0	G5	G7	G11
PD16		LR3		R0	G02
PD17	LR2	LR2		R1	G12
PD18	LR1	LR1	R0	R2	G03
PD19	LR0	LR0	R1	R3	G13
PD20		UR3	R2	R4	G04
PD21	UR2	UR2	R3	R5	G14
PD22	UR1	UG1	R4	R6	G05
PD23	UR0	UG0	R5	R7	G15
PD24					B00
PD25					B10
PD26					B01
PD27					B11
PD28					B02
PD29					B12
PD30					B03
PD31					B13
PD32					B04
PD33					B14
PD34					B05
PD35					B15

Image 4040

4. Controller



PC20000301 (PCM-9372) CPU Board

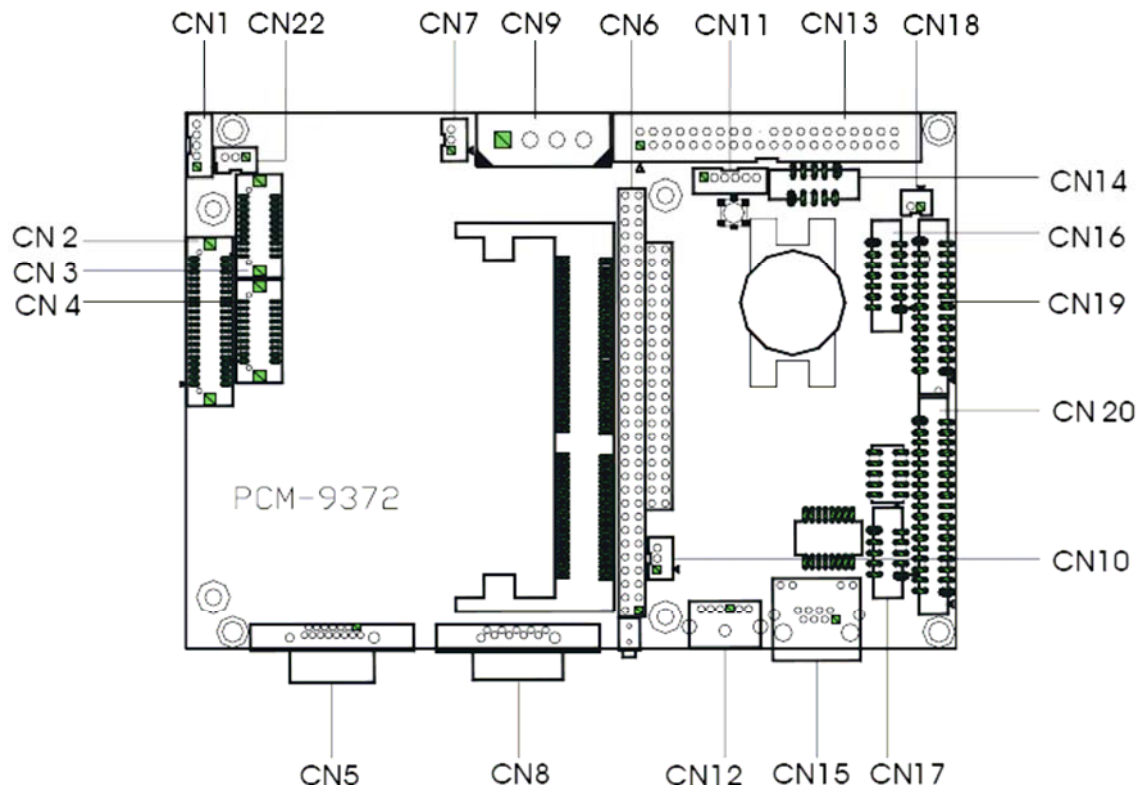


Figure 25: CPU PCB Component Side



PC20000301 (PCM-9372) CPU Board Specifications

1.1 Introduction

The PCM-9372 is a low-power Eden processor single board computer (SBC) with audio controller, a 4X AGP SVGA controller, a PCI 10/100 Base-T Ethernet interface, 2 Channel LVDS interface, and one PC/104 expansion connector. The PCM-9372's design is based on a 3.5" HDD form factor that provides a convenient connector layout for easy assembly, more efficient cable connections and better overall embedded system integration. When using a VIA Eden processor, the PCM-9372 achieves outstanding performance that surpasses most SBC's in its class. This compact (only 5.7" X 4") unit offers all the function of a single board industrial computer, but still fits in the space of a 3.5" floppy drive. On board features include, two serial ports (one RS-232, one RS-232/422/485) one multi-mode parallel (ECP/EPP/SPP) port, two USB (Universal Serial Bus) ports, a floppy drive controller, and a keyboard PS/2 mouse interface. The built-in high-speed PCI IDE controller supports both PIO and UDMA/100 bus master modes. Up to four IDE devices can be connected, including large hard disks, CD-ROM drives, and tape backup drives.

The PCM-9372 features power management to minimize power consumption. It complies with the "Green Function" standard and supports Doze, Standby and Suspend modes. In addition, the board's watchdog timer can automatically reset the system or generate an interrupt if the system stops due to a program bug or EMI.

1.1.1 Highly integrated multimedia SBC

The real estate is well packed on this tightly designed 3.5" single board computer (SBC) with an onboard new VIA Embedded low power Eden processor. The Via Eden processor uses advanced 0.15μ/0.13μ CMOS technology with 128KB L1 cache memory and 64 KB L2 Cache memory. This board can operate without a fan at temperatures up to 60 degrees centigrade (140 degrees Fahrenheit) and typically consumes fewer than 12 Watts while supporting numerous peripherals. This SBC includes a 4X AGP controller, an AC'97 audio interface, a PCI Ethernet interface, and 2 channel LVDS interface. Its design is based on the 3.5" SBC form factor that supports the PC/104 interface for ISA module upgrades. Other on-board features include an LPT, 2 USB's, and 2 serial ports: 1 RS-232, and 1 RS232/422/485. The SSD solution supports CompactFlash[®] cards Type I and Type II.



1.2 Features

- Embedded VIA low-power Eden processor
- Supports one 36 bit TFT LCD panel, with up to 1024 X 768 resolution
- Supports 2 channel LVDS interface
- 100/10Base-T Ethernet interface, IEEE 802.3U compatible
- Supports wake-in-LAN with ATX power supply
- 2 serial ports (one RS-232 and one RS-232/422/485)
- USB interface complies with USB Rev. 1.10
- 62-level Watchdog timer by system reset or IRQ
- 1 IDE channels support up to UDMA/100

1.3 Specifications

1.3.1 Standard 3.5" Biscuit SBC Function

- **CPU:** Onboard Eden 667 MHz (PCM-9372F-M0A1) or Via Eden 400 MHz processor (PCM-9372-J0A1) with 128KB L1 cache memory.
- **BIOS:** Award 256 KB Flash memory.
- **System Memory:** One 144-pin SODIMM socket accepts 64MB up to 512 MB SDRAM.
- **2nd Cache Memory:** 64 KB on the processor.
- **Enhanced IDE Interface:** One channels support up to two EIDE devices. BIOS auto-detect PIO Mode 3 or Mode 4, supports up to UDMA 66/100 mode.
- **FDD Interface:** Supports up to two FDD's.
- **Serial ports:** Two serial RS-232 ports. COM1: RS-232, COM2 RS-232/422/482.
- **Parallel Port:** One parallel port, supports SPP/EPP/ECP mode.
- **Keyboard/Mouse Connector:** Supports standard PC/AT keyboard and a PS/2 mouse.
- **Power Management:** Supports power saving modes including Normal/Standby/Suspend modes, APM 1.2 compliant.
- **Watchdog Timer:** 62 level timer intervals.
- **USB:** Two USB 1.1 compliant Universal Serial Bus ports.
- **Expansion:** One PC104 Connector for ISA control board.
- **Solid State Disk:** Supports on 50-pin socket for CFC type I/II.



1.3.2 VGA/LCD Interface

- **Chipset:** VIA Twister chip with integrated Savage4 2D/3D/ Video Accelerator.
- **Frame Buffer:** Supports 4/8/16/32MB frame buffer with system memory
- **Interface:** 4X AGP VGA/LCD interface. Support for 9, 12, 15, 18, 24, 36 bit TFT and optional 16 or 24 bit DSTN panel
- **Display Mode:** CRT modes: 1280 X 768 @ 16bpp (60Hz), 1024 X 768 @ 16bpp (85Hz): LCD/Simultaneous Modes: 1280 X 1024 @ 16bpp (60 Hz), 1024 X 768 @ 16bpp (60 Hz)
- **LVDS:** supports 2 Channel (2 X 18 Bit) LVDS interface.

1.3.3 Ethernet Interface

- **Chipset:** RTL 8100
- **Ethernet Interface:** IEEE 802.3u 100BASE-T Fast Ethernet compatible.
- I/O address switching setting
- Built-in boot ROM

1.3.4 Audio Function

- **Chipset:** VIA 82C686
- **Audio Controller:** AC'97 ver. 2.0 compliant Interface.
- **Audio Interface:** Microphone in, line in, line out.

1.3.5 Mechanical and Environmental

- **Dimensions:** 145 X 102 mm (5.9" X 4.22")
- **Power Supply Voltage:** -5V +/-5% and +12V +/-5%
- **Power Requirements:** Max 4.5A @ -5V, 1.3A @ +12V (within 5ms after power on)
Typical 2.08A @ -5V, 0.08A @ +12V (w/Eden-400, 128MB)
Typical 2.33A @ -5V, 0.08A @ +12V (w/Eden-667, 128MB)
- **Operating Temperature:** 0 – 60 degrees Celsius (32 – 140 degrees Fahrenheit)
- **Weight:** 0.85 kg (weight of total package)



Award BIOS Setup

Important: The password is 5457500 and must be entered to gain access to the bios.

2.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the test, you will either hear a few short beeps or see an error message on the screen. These are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions.

Press <F1> to RESUME

Write down the message and press the F! key to continue the boot up sequence.

2.1.1 System Configuration Verification

These routines check the current system configuration against the values stored in the board's CMOS memory. If they do not match the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

These are three situations in which you will need to change the CMOS settings

1. You are starting your system for the first time.
2. You have changed the hardware attached to your system.
3. The CMOS memory has lost power and the configuration information has been erased.

The PCM-9372 Series CMOS memory has an integral lithium battery backup. The battery backup should last ten years in normal service, but when it finally runs down you will need to replace the complete unit.

Award's BIOS ROM has a built in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery backed CMOS RAM so that it retains the Setup information when the power is turned off.

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Figure 26: Entering Setup



Figure 27: Standard CMOS Features Setup

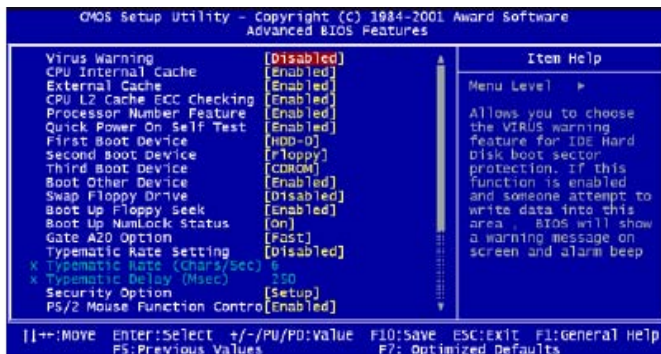


Figure 28: Advanced BIOS Features Setup

2.2.1 Entering Setup

Power on the computer and press immediately. This allows you to enter setup.

2.2.2 Standard CMOS Features Setup

When you choose the Standard CMOS Features option from the initial setup screen menu, the screen shown to the left is displayed. This standard setup menu allows users to configure system components such as date time, hard drive, floppy drive and display. Once a field is highlighted, online help information is displayed in the left bottom of the menu screen.

2.2.3 Advanced BIOS Features Setup

By choosing the Advanced BIOS Features Setup option from the initial setup screen menu the screen to the left will be displayed. This sample screen contains the manufacturer's default values for the PCM-9372 Series.

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Figure 29: Advanced Chipset Features Setup



Figure 30: Integrated Peripherals



Figure 31: Power Management Setup

2.2.4 Advanced Chipset Features Setup

By choosing the Advanced Chipset Features option from the initial setup screen menu, the screen to the left will be displayed. This sample screen contains the manufacturer's default values for the PCM-9372 Series.

2.2.5 Integrated Peripherals

By choosing the Integrated Peripherals option from the initial setup screen menu, the screen to the left will be displayed. This sample screen contains the manufacturer's default values for the PCM-9372 Series.

2.2.6 Power Management Setup

By choosing the Power Management Peripherals option from the initial setup screen menu, the screen to the left will be displayed. This sample screen contains the manufacturer's default values for the PCM-9372 Series.

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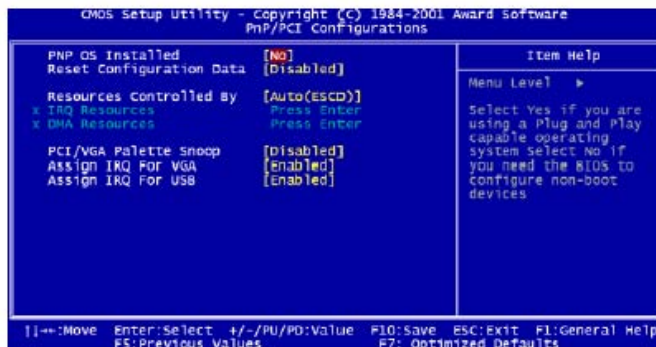


Figure 32: PnP/PCI Configuration

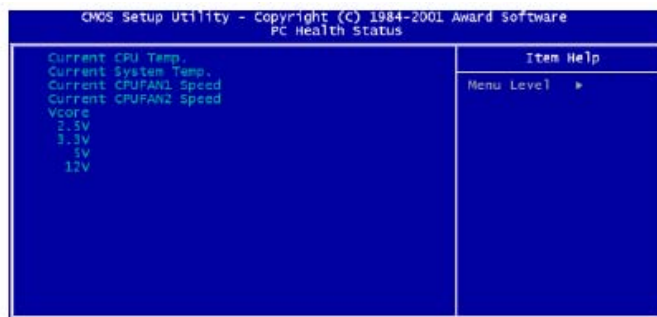


Figure 33: PC Health Status



Figure 34: Load Optimized Defaults

2.2.7 PnP/PCI Configurations

By choosing the PnP/PCI Configuration option from the initial setup screen menu, the screen to the left will be displayed. This sample screen contains the manufacturer's default values for the PCM-9372 Series.

2.2.8 PC Health Status

The PC Health Status option displays information such as CPU and Motherboard temperatures, fan speeds, and core voltage.

2.2.9 Load Optimized Defaults

Load Optimized Defaults loads the default system values directly from ROM. If the stored record created by the Setup program should ever become corrupted (and therefore unusable) these defaults will load automatically when you turn the PCM-9372 Series system on.

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4. Controller



2.2.10 Save and Exit Setup

If you select this option and press <Y> then <Enter> the values entered in the setup utilities will be recorded in the chipset's CMOS memory. The microprocessor will check this every time you turn you system on and use the settings to configure the system. This record is required for the system to operate.

2.2.11 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

Image 4040 BIOS Settings

Press the DEL key to enter Bios setup

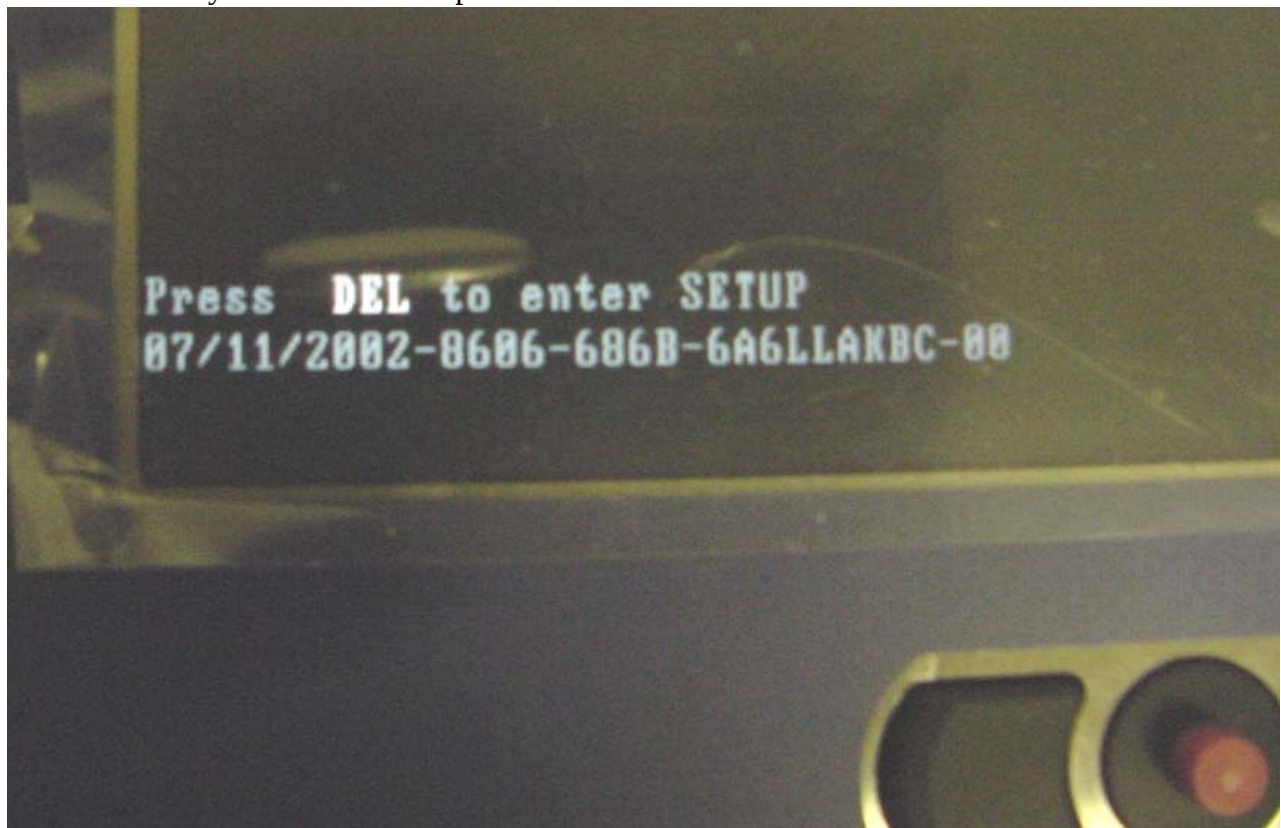


Figure 35: Entering BIOS

Image 4040

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Category	Option	Setting
ENSURE THE “NUM LOCK” LIGHT IS ON		

Standard CMOS Features

Date (mm:dd:yy)	Current Date
Time (hh:mm:ss)	Current Time (24hr)
Drive A	None

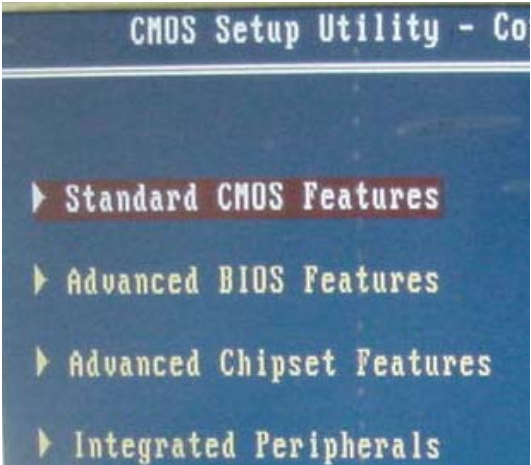


Figure 36: Entering Standard CMOS

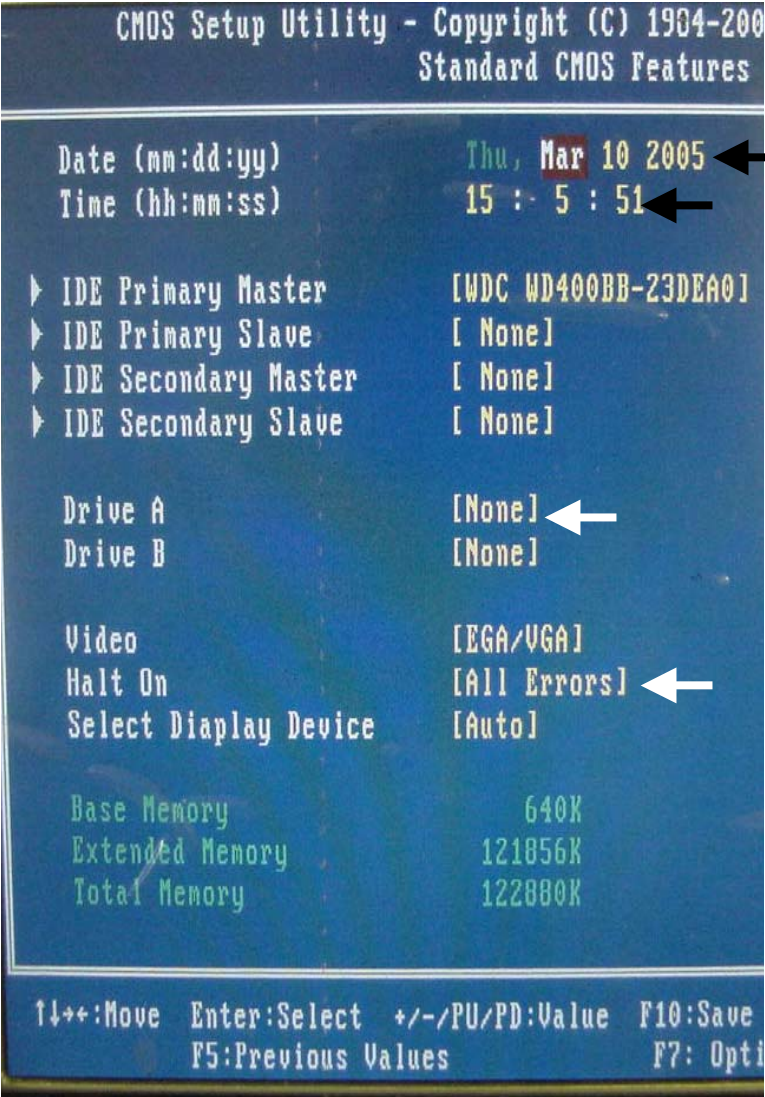


Figure 37: Standard CMOS Settings

Press <Esc>

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Advanced BIOS setup

First Boot Device	[HDD-0]
Second Boot Device	Disabled
Third Boot Device	Disabled
Boot Other Device	Disabled
Boot Up Floppy Seek	Disabled

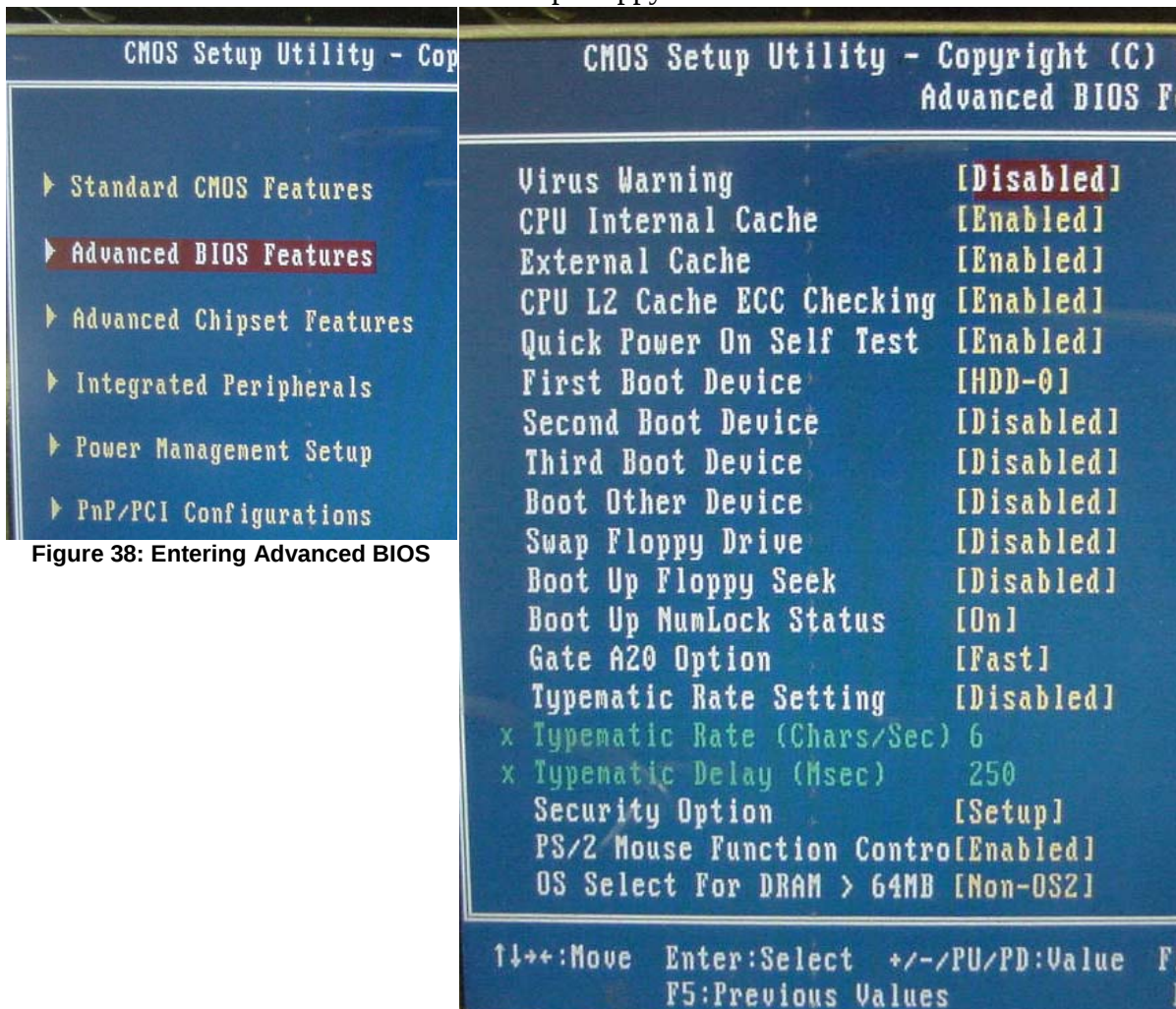


Figure 38: Entering Advanced BIOS

Figure 39: Advanced BIOS Settings

Press <Esc>

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<u>Category</u>	<u>Option</u>	<u>Setting</u>
<u>Advanced Chipset Features</u>	Panel Type	[TFT 800x600 LVDS]
	USB Keyboard Support	Enable
	USB Mouse Support	Enable
	On Chip Sound	Disabled

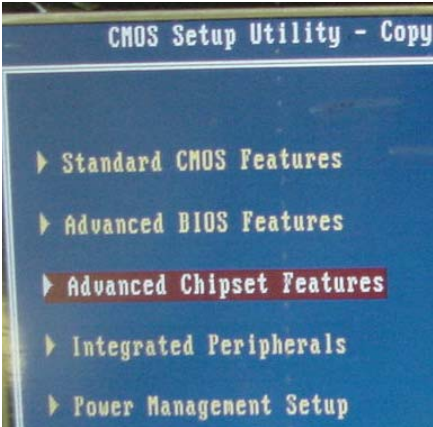


Figure 40: Entering Advanced Chipset

USB Mouse Support
may not be an option
on some CPU boards

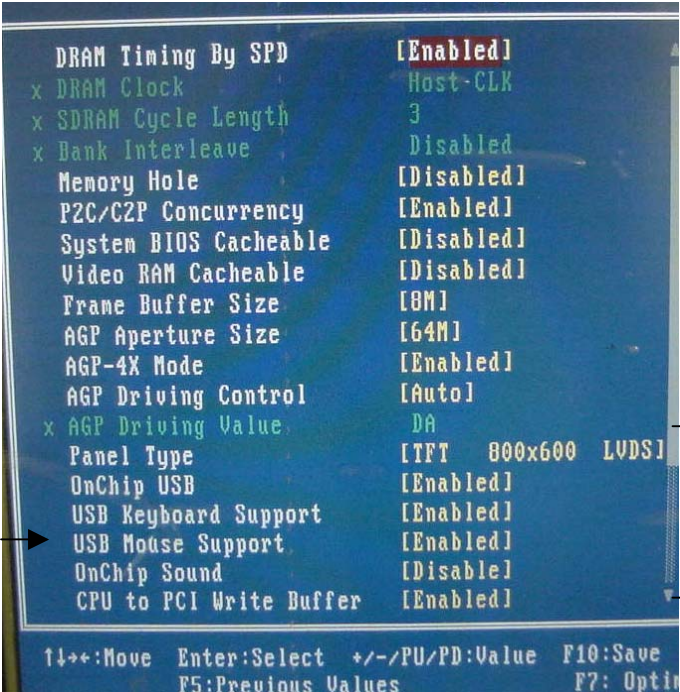


Figure 41: Advanced Chipset Settings

Press <Esc>

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Intergrated Peripherals

On Chip IDE Channel1 Disabled
Onboard Legacy Audio Disabled

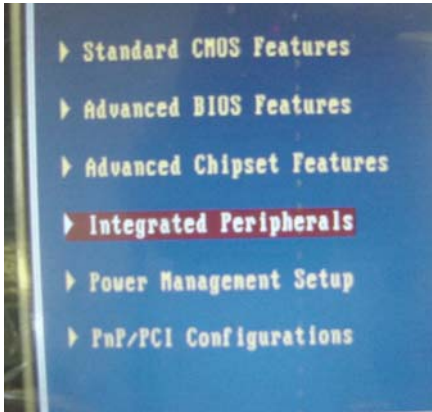
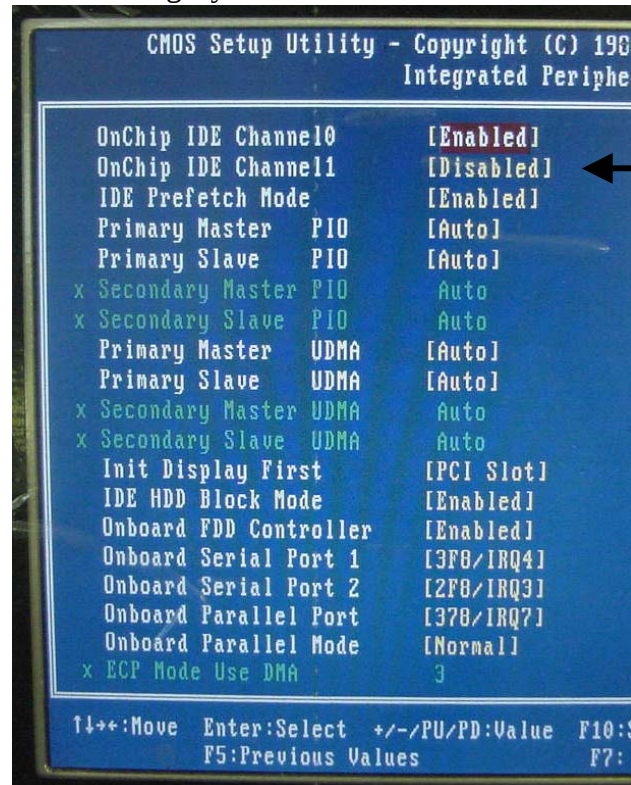
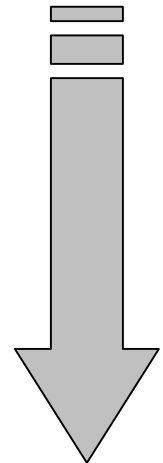


Figure 42: Entering Integrated Peripherals



Scroll
Down
To View



Onboard
Legacy Audio

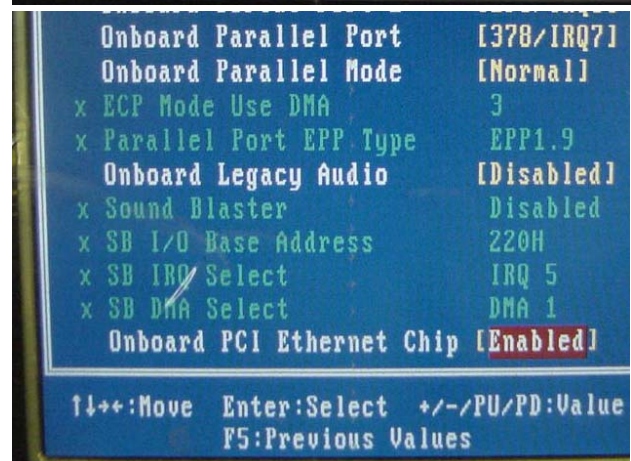


Figure 43: Integrated Peripherals Settings

Press <Esc>

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PnP/PCI Configuration

PNP OS Installed

YES

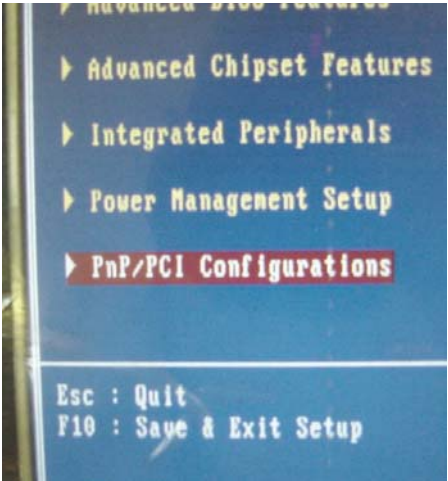


Figure 44: Entering PnP/PCI Configuration

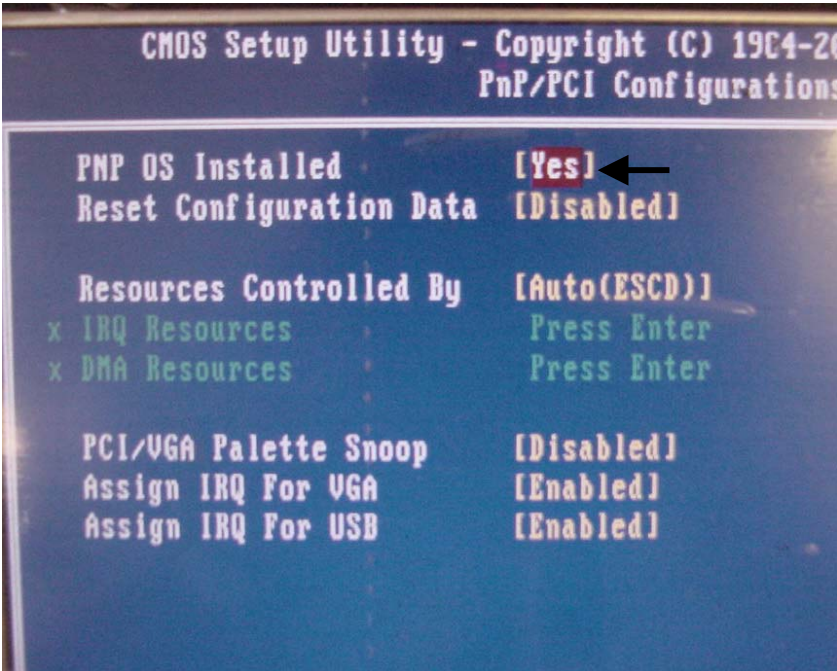


Figure 45: PnP/PCI Configuration Settings

Press <Esc>



Set Password



Figure 46: Entering Set Password

Set Password 5457500
Confirm Password 5457500

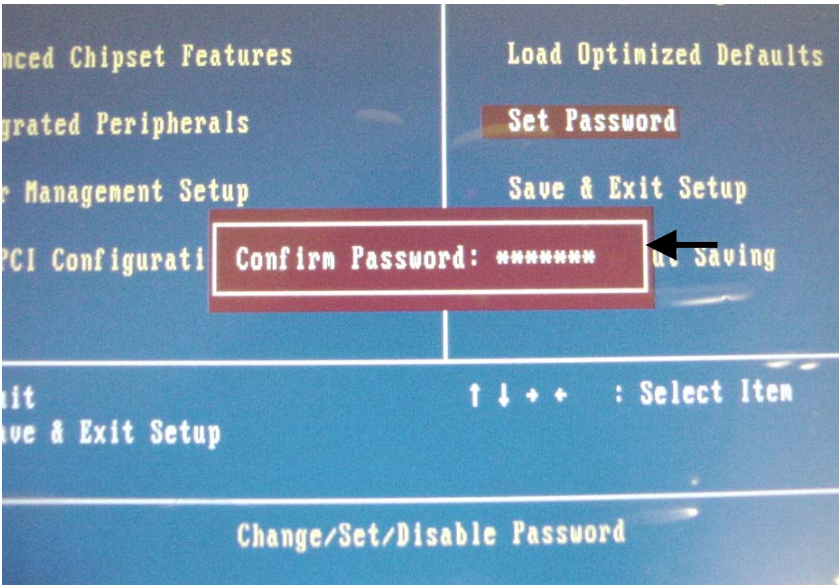
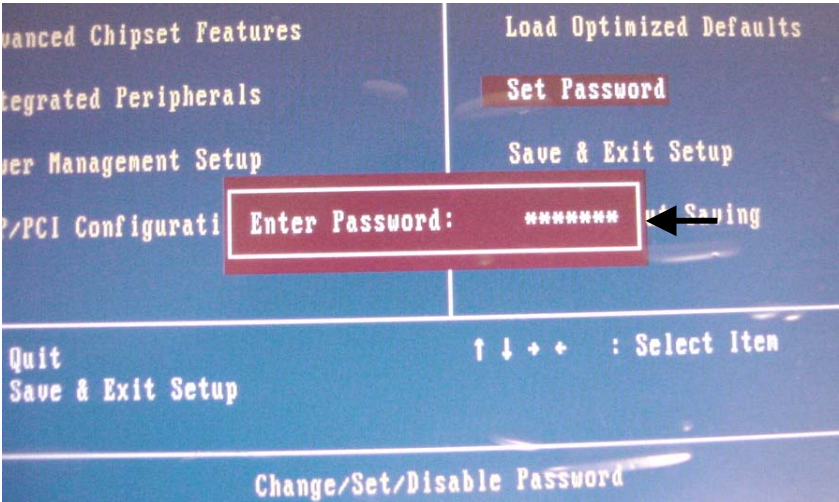


Figure 47: Set Password

Save & Exit Setup

Press “F10” to “save” (Y/N) Y

Image 4040

4. Controller



Cleaning the vent screens and fan inside the 4040



Figure 48: Required Tools

Required tools

- Compressed air with blow gun
 - Optional (Compressed cleaning spray aerosol)
- 4040 lid key (MP10002203)

Instructions

1. Use normal shut down procedures to shut down and power off the controller. Click on the “New Message” icon.
2. Use the lid key to unlock the controller lid by turning counter clock-wise. Open the lid.
3. In the bottom of the controller, locate the intake screen near the back left hand corner.
4. Use the air gun to remove dust and debris by blowing directly on the screen downward from the inside to out.

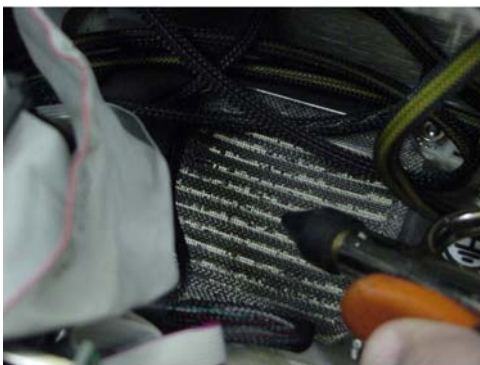


Figure 49: Shut Down Controller



Figure 50: Locate Filters



Figure 51: Blow Out Filters



Figure 52: Blow Out Fan

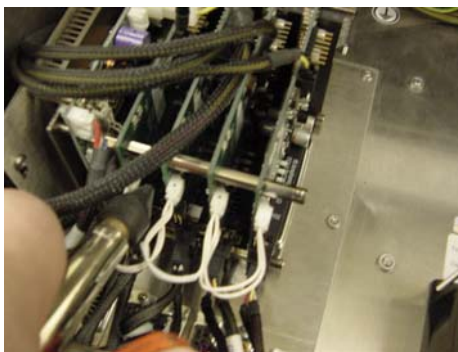
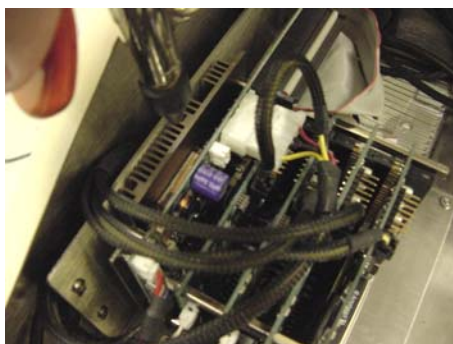


Figure 53: Blow Out Board Stack



5. In the bottom of the controller, locate the exhaust fan near the front right corner.

6. Use small short bursts of air to remove dust and debris. *(Note: excess air pressure can damage the fan and/or components.)*

7. Use small bursts of air to blow away dust and debris from between the system boards and CPU heat sink. *(Note: excess air pressure can damage the fan and/or components.)* (PIC)

8. To finish, blow out the entire controller to remove any loose particles.



Figure 54: Clean Out Controller



The XJ500 Print Module consists of two major components:

- The IDS2/500 Ink Delivery System (Ink Circuit)
- The Xaar, XJ500 Printhead

Maintenance

With Oil Based Inks

Using oil based inks to print strictly onto porous substrates; there is virtually no maintenance necessary. Since oil based ink dries by absorption only, ink can be left inside the printhead for very long periods of time (weeks, even months). After periods as long as this at most a slight amount of priming (2-3 pumps) may be necessary.

Once the printhead is primed, the printer should keep running as long as you put ink into it.

Semi-Annual Preventive Maintenance Procedure:

(The following procedures should be performed approximately twice a year for high volume customers and approximately once a year for low to moderate use customers).

1. Open the cover on the print module and lift out the ink tray.
2. Disconnect the ink lines from the ink tray. Using the luer fittings stored inside the print module, cap the ink lines.
3. Replace the filter and o-rings in the filter assembly attached to the ink tray. See drawing on page 102.
4. Set aside the ink tray, needle facing up.
5. Disconnect the ink low light connected to the power distribution board. This is a locking connector; do not forcefully remove.
6. Remove the 6 “Phillips” head screws and lift the case off the print module.
7. Release the wire holding the inkbottle in place. Carefully lift the bottle out of the holder so it can be emptied into a waste container. (It is not necessary to disconnect the ink lines to complete this operation).
8. Empty ink from both bottles.
9. Using a tube cutter or razor knife cut all four tubes $\frac{1}{2}$ ” away from bottle.
10. Remove the bottles.
11. Visually inspect each bottle - Replace bottles that appear to have any level of contamination. This includes any settled material at the bottom of the bottle. Do not reconnect the ink lines at this time. Clean any bottles that do not appear to be contaminated. Fill with approximately 1 inch of cleaner, swirl around container rinsing bottom and sides, pour into waste container, and repeat. Do not reconnect the ink lines at this time.
12. Replace the pressure switch if the old style switch is still installed. (Per NAM Technical bulletin # TB28-052704A).
13. Reconnect the tubing to “New” or “Freshly” cleaned inkbottles. Be certain all tubes are pressed onto the fittings firmly and are numbered properly. Attachment C is an ink flow diagram.
14. The filter kit should be replaced if there is ink present in the filter. See drawing on page 102.



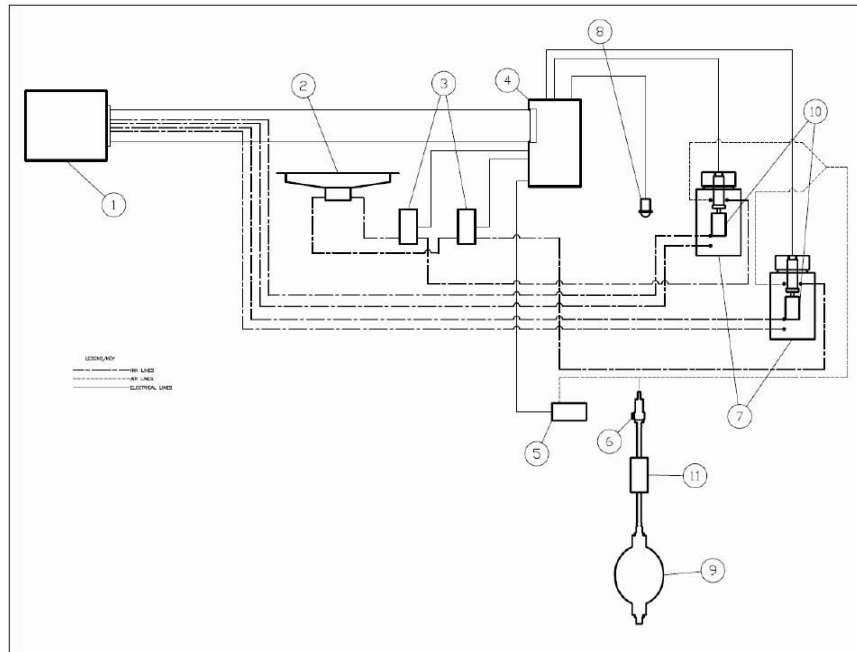
15. Remove the nozzle plate cover (It is not necessary to completely remove the screws; the nozzle plate cover is slotted and will slide off once the screws are loosened. Remove the 6 “Phillips” head screws and carefully slide the print head shell toward the nozzle plate to remove. CAUTION – the head shell may contain ink, remove carefully.
16. Disconnect the ink lines at the print head. Start with the top fitting and work down. DO NOT use any tools when removing or reconnecting the ink lines they should be finger tight only. Using a tool may damage the print head connectors.
17. Fill each bottle with approximately two inches of cleaner. Replace the lid on each bottle. Using the priming bulb flush the ink lines until the cleaner runs clear. Fluid will discharge from all four lines simultaneously.
18. Reconnect the ink lines. Start from the bottom and work toward the top. DO NOT use any tools; the fittings should be only finger tight.
19. Check fluid level in the bottles, refill if necessary. Do not exceed two inches. Using the priming bulb, flush the print head until all nozzles stream clear.
20. Reassemble the print head assembly.
21. Empty any remaining cleaner from the bottles into the waste container.
22. Refill both bottles with fresh ink. Do not overfill. Ink should be filled to the top of aluminum bottle holder.
23. Reassemble the print module.
24. Introduce an ink bag.
25. Visually inspect the 4040 controller, look for damage or abuse.
26. Blow out the cover screens and the fan.
27. Connect the print module to a 4040 controller. Turn on power and allow the controller to boot.
28. Using the priming bulb, Re-prime the print head.
29. Check your solenoid sensors, while priming Both LED’s (solenoid 1 and solenoid 2) should illuminate, the ink low light may not illuminate for several minutes. Squeeze the ink bag, within 20 seconds the solenoid lights should turn off.
30. Because the print head has been disconnected you must vacuum prime the print head. Vacuum the print head for at least thirty seconds at 15-20 inches Hg vacuum. Test print.
31. Change the Ink Filter and O-rings underneath the ink tray.

As needed:

- Install new ink
- Pressure prime the printhead
- Empty the ink waste container



Theory of Operations



Theory of Operation during the Priming Process:

- Air is pumped into the ink reservoirs (7) via the Air Filter (11) using the Priming Pump (9). *The purpose of the air filter is to prevent particulates from the atmosphere from entering into the ink.
- Simultaneously, the positive air pressure is sensed by the Pressure switch (5).
- The Pressure Switch then opens, which closes Solenoid Valves 1 and 2 (3).
- With the Solenoid Valves closed, the air pressure being forced into the Ink Reservoirs pushes the ink out into the Printhead (1).
- As the ink is pushed out of the Reservoirs and into the head, the ink level in the ink reservoirs decreases. When the ink level becomes low enough, the Ink Level Floats (10) will detect this and send a signal to open the Solenoid Valves (3). The Solenoid Valves however are being kept closed by the pressure switch to prevent the air from taking the path of least resistance and filling up the Ink Bag (2) with air.
- When the air pressure is let off, the Solenoid Valves (3) will finally open allowing ink to re-fill the Ink Reservoirs (7). Whenever the one or both of Solenoid Valves are open and ink is filling, the amber colored LED, labeled on ink tank Res. 1 or Res. 2 will illuminate. Since the fill rates will be slightly different for each reservoir the LEDs will not always illuminate simultaneously.

Theory of Operation during the Printing Process:

- As the Printhead (1) ejects ink onto the print target, the Ink Reservoirs (7) feed the Printhead. There are four ink inputs to the printhead, all corresponding a particular ink tube out of the Ink Reservoirs. The ink lines are numbered in order, beginning from the bottom. The lower Ink Reservoir is Res. 1 and the upper Reservoir is Res. 2. Ink lines 1 and 2 exit from Res.1 and ink lines 3 and 4 exit from Res. 2. The printhead is divided into four quadrants with its own ink input, beginning from the top, 1-4.
- Depending on the design of the printed message, different quadrants of the Printhead (1) may use more ink volume. Therefore Res. 1 may need to be re-filled more often than Res. 2 and vice versa.
- The Ink reservoirs are supplied ink from the Ink Bag (2). When the ink level inside the bag becomes low, it will take too long to fill the Ink Reservoirs. There is a 5 minute (approximately) timer in the software that times how fast the Ink Reservoirs fill. If one or both of them take longer than 5 minutes to fill, the Ink Low Light (8) will flash on and off. If the light stays on, then it is time to replace the bag. *Occasionally if the system was primed excessively and one or both of the ink reservoirs is abnormally low, ink refill will require more than 5 minutes. In this case the light will flash and then turn off when the reservoir(s) is refilled.



Trouble Shooting

With Oil Based Inks

Symptom: Ink will not prime into print head.

Possible cause	Possible solution
Shipping seal not removed from nozzle face.	Remove the shipping seal from the nozzle face.
Luer fittings on air intake tube not connected inside ink system.	Lift ink tray and connect the luer fittings inside the ink delivery system (IDS).
Ink system will not hold air pressure when pumped	Lift the ink tray and check for leaks in ink sub-reservoir bottles inside IDS.

Symptom: Ink low LED will not turn off and Res. 1 or Res. 2 LED will not turn off.

Possible cause	Possible solution
Ink Bag empty	Check ink bag. If empty, replace.
The Priming Bulb valve is closed with bottles still pressurized.	Make sure that there is no pressure on the system by ensuring that the priming bulb valve is open. If there is even a slight amount of pressure, the "fill" solenoid valves will never open to re-fill the sub-reservoirs. *This would be noticeable because the head would weep slightly, which should cause poor print quality, even drop out starting at the bottom portion of the head, working upward.
Clogged Ink Fill Needle.	Sometimes a small piece of the rubber septum can tear off when a new ink bag is inserted, clogging the needle. Remove the ink bag and poke a paper clip or small wire into the needle from the top. If there is debris inside the needle, this action will loosen it and it will fall into the ink filter. This is ok and will not harm performance.
Ink bottle sensor(s) malfunctioning or disconnected.	Check the wire connections inside IDS. The odds of one of the sensors themselves failing are extremely low.



Symptom: Print quality is degraded, i.e. missing lines (dots), spattered print (satellites), sections of the printed image missing.

Possible cause	Possible solution
Too much throw distance	Make sure that proper product handling is in place and that guide rails are adjusted to that the product is within 1-5mm, especially if printing barcodes.
Printhead has ingested air. This is typical after servicing a printhead or upon initial installation if vacuum priming was not performed sufficiently.	The easiest way to tell if the printhead has ingested air is the following: The print begins to drop out, gradually becoming worse. You pressure prime the head and recover the nozzles, but within a short period of time the symptoms repeat and the nozzles drop out again. THIS IS ALWAYS AIR. You can determine that all of the air is out of the printhead and that vacuum priming was sufficient by the following method. After vacuum priming, pressure prime for a few pumps. On the first pump, if there is still air trapped inside the head you will see tiny bubbles (like foam) come out of the upper nozzles. If this happens, vacuum prime again and repeat the process. This can happen from excessive shock, or if the printer was allowed to run low enough on ink (well after the bag was empty) that the sub-reservoirs actually ran low enough to ingest ink into the printhead. This symptom may also occur immediately after initial installation or after servicing the printhead if vacuum priming was not sufficient. Vacuum priming is necessary if printhead will not recover and maintain prime with a significant pressure prime using the hand pump.
Printhead Starvation	Starvation can occur if the printhead has been raised too much in relationship to the IDS. The brackets have marking on them and the dimensions are called out in the user manual and in this manual. Lower the printhead according to the markings on the brackets. Starvation can also occur under extremely high throughput. Meaning, very fast line speed, coupled with fast print repetition rate and large message. If the printhead cannot maintain prime under these circumstances, the printhead may be lowered slightly until it will maintain prime. To get a true reading, a vacuum prime will be necessary each time the printhead loses prime.
Printhead flooding (weeping)	The printhead will weep if it is adjusted too low in relation to the IDS. Raise the head according to the bracket markings. Positive pressure will also cause weeping. See section above regarding "Ink low LED will not turn off".
Debris stuck to nozzle plate	Sometimes in very dirty, dusty conditions, debris can land on the nozzles and stick to the wet ink on the nozzle plate causing some nozzles to become deflected. Pressure prime the printhead with 2-3 pumps to displace the debris and clear nozzles.
Printhead clogged	The printhead could be internally clogged, but this is very rare. See section below on "Flushing Printheads" to attempt to recover the clogged nozzles.
Printhead or section of printhead dead	It is possible although rare for a printhead to fail electrically. If a complete section of nozzles is out and you cannot recover any of them by priming or vacuum priming, there is a good chance that an ASIC inside the printhead has failed. In this case, the printhead must be replaced.
Scabbing, nozzles crusted over with dried ink.	This only happens with solvent base. To recover, pressure prime for 2-3 pumps. Make sure that the Voltage-Spit/Buzz settings are appropriate for the ink type.



Vacuum Priming the Printhead

Before operating the system you must remove all the air from the ink lines and printhead. This can be accomplished by a combination of two methods. For maximum print quality vacuum priming may be necessary.

Vacuum – A cap is fitted over the nozzle plate. A vacuum is applied for a short time drawing out any excess air. Vacuum purging is highly effective at removing air from the printhead. Recommended when doing an initial installation, or when ink lines have been detached.

Pressurizing – positive pressure is applied to the ink supply. The ink delivery system is fitted with a hand pump to provide a simple method for purging. This method is used when a partial de-prime has occurred.



Figure 55: Loosen Thumb Screws

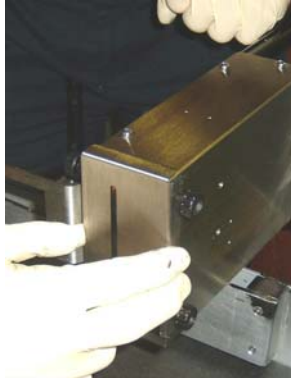


Figure 56: Remove Cover

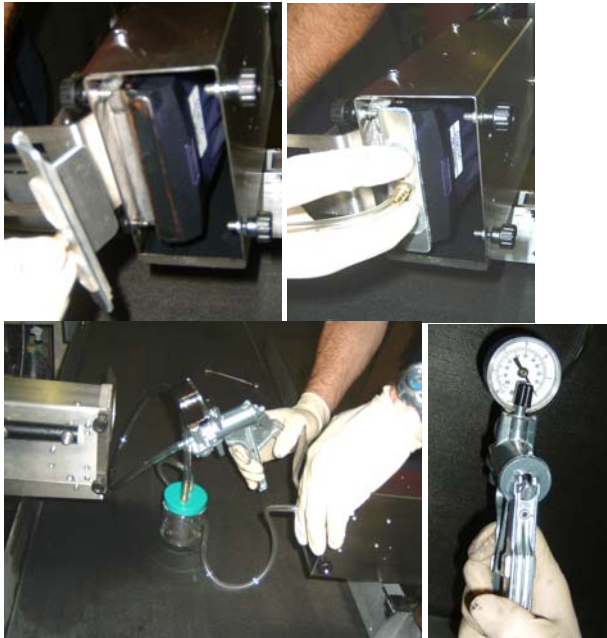


Figure 57: Remove Seal

1. Loosen the four thumbscrews holding the nozzle cover.
2. Gently remove the cover as shown.
3. Once the Nozzle Cover is removed, remove the rubber nozzle seal from the inside of the cover. Keep this seal in a safe place in the event that the equipment ever needs to be shipped again.



Vacuum Priming the XJ500 Head



Step 1 - Vacuuming

Place the vacuum cap over the printhead. There is a slot along the side of the printhead. The tab on the vacuum cap should be inserted into the slot. This must be done carefully to create a vacuum. Hold the vacuum cap firmly assuring that the rubber gasket is sealed to the face of the printhead. Squeeze the hand pump rapidly for 20 to 30 seconds. Both air and ink will be pulled through the printhead into a collection jar. When performing this procedure the ink jet system might indicate **WARNING Low Ink**. This is OK.

Caution – recommended vacuum pressure is 700 m/bar, do not exceed 900 m/bar.

Remove the vacuum cap. After performing the vacuum priming procedure proceed to the pressure priming function.

Figure 58: Vacuum Priming

The vacuum priming operation should be performed during installation or after maintenance requiring printhead exchange or if the tubing is disconnected. The vacuum pump is necessary to remove trapped air bubbles from tubing and inside the printhead. To use the vacuum pump follow step one on the previous page. For care of the vacuum take the following precautions.

When connecting the vacuum

- 1 Make sure that the ink jar is empty before you start.
- 2 Ensure that the ink jar is screwed on tightly to ink jar cover. This will prevent ink spills and leaking during the vacuum process.
- 3 During the vacuum process pay special attention to the ink jar, to ensure that the jar does not over fill. Although the ink jar is transparent when it begins to receive ink products it's transparency will diminish and seeing through the jar will become difficult. It may be necessary .to remove the jar from the jar holder to how full the jar is. Failure in properly monitoring ink levels in the ink jar will result in being sucked into the pump and spraying out.
- 4 After you have finished the vacuum process empty the ink jar. It is a good idea to wrap the cap in an absorbent cloth to absorb any excess ink product and prevent spills.

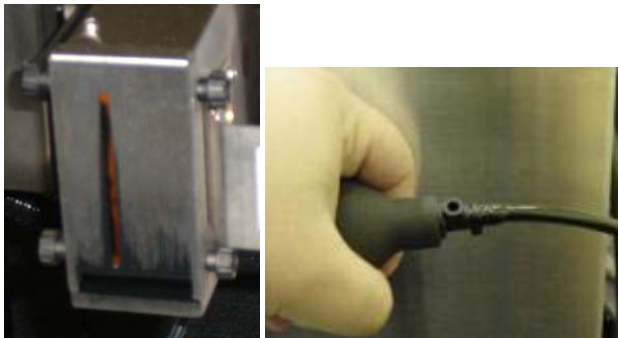
Use a spray cleaner or flushing solution used with the ink that you are using to keep the vacuum pump clean.



Pressure Priming the XJ500 Printhead



Squeezing the priming pump to pressure prime the printhead.



Be sure to turn the air valve back counter clockwise to release the pressure when finished priming.

Figure 59: Pressure Priming

Occasionally debris may settle on the outside of the nozzles or a small air bubble may trap in one or more of the nozzles. The appearance will be as if there are lines through the print. To recover those nozzles, simply do a pressure prime instead of a vacuum prime. If the symptoms recur then vacuum prime the head again.

1. Squeeze the priming pump 3 times and let the pressure off.
2. Perform a test print.
3. If the lines remain, repeat step 1.

There is no need to catch the ink or to wipe the head when printing horizontally. The printhead will catch the excess ink into its own reservoir.

Results of pressure priming the printhead. Ink purges out of the nozzles and flows down the nozzle face into a containment area in the bottom of the printhead housing. The waste ink will drain into the ink waste container. If after priming, there is excess ink on the face of the printhead cover, it may be wiped off using a lint free wipe so that the excess ink does not smear onto the box.



Removing/Installing the XJ500 Printhead



Figure 60: Loosen Thumb Screws

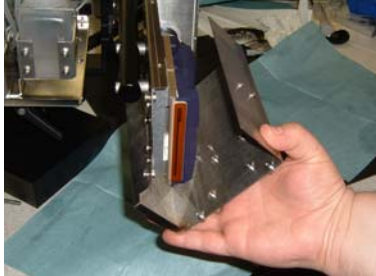


Figure 61: Loosen Side Cover Screws and Remove



Figure 62: Visually Inspect Printhead



Figure 63: Loosen Fittings

1. Loosen the four thumbscrews or Philips screws (depending on version) enough to slide the faceplate off.

2. After loosening the corresponding screws to loosen the side cover, remove it.

3. Visually inspect the printhead for damage or abnormalities.

4. Using a ½ inch or 12 mm box end wrench turn the black fitting counter clockwise about ¼ - 1/2 turn to loosen. You may loosen all four fittings with the wrench and then use your fingers to keep turning the fittings until they come off.

*Note: Be sure that the printhead is at a position above the ink or the ink system is empty when removing tubes. Otherwise a lot of ink will drip out of the tubes and leave a large mess.



Figure 64: Remove Tubing from Printhead



Figure 65: Do Not Remove Black and White Fittings

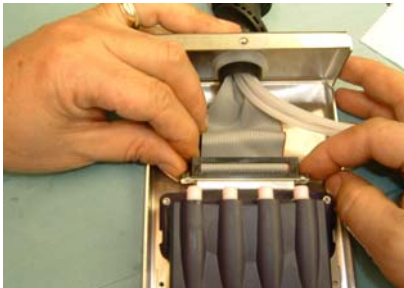


Figure 66: Remove Cable from Printhead

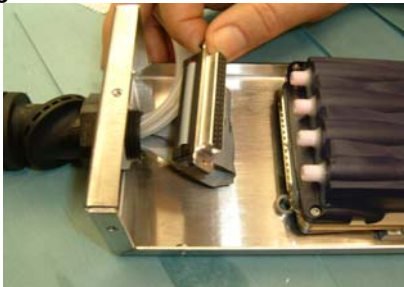


Figure 67: Visually Inspect Cable

5. Carefully remove the tube from the printhead by pulling straight back. Repeat for all four tubes.
6. Do not remove the black and white ferrule fittings from the tube so they do not get lost. If they accidentally come off, be sure to re-assemble according to this photo.
7. Remove the cable connector using two index fingers. Pull gently back until the connector is removed.
8. Once removed, pull back and inspect. Make sure that it is clean and dry (free of ink) before re-connecting.

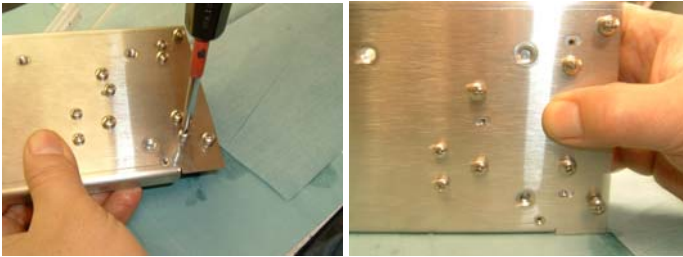


Figure 68: Remove Printhead Mounting Screws

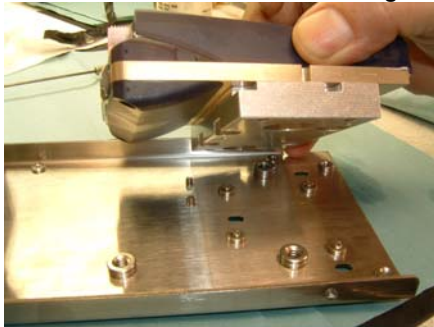


Figure 69: Assure Forward Positioning When Reinstalling

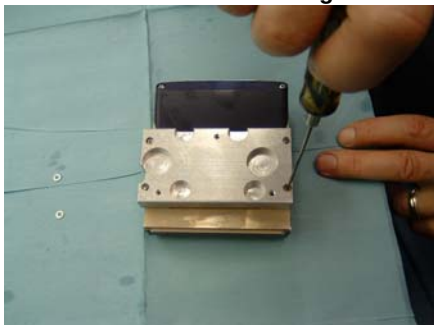


Figure 70: Place Printhead Upside Down

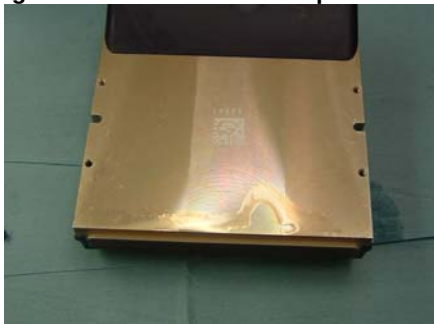


Figure 71: Remove Four Cap Screws

9. Remove the printhead mounting screws and store in a safe place.

10. When the 3-printhead mounting screws are removed, notice that the holes in the head shell are slotted. When re-installing the printhead, be sure to slide the screws all the way forward, pushing the printhead close to the nozzle protector plate. This will decrease the inherent throw distance.

11. With screws removed, lift printhead from base and place upside down onto a clean work surface.

12. With Printhead upside down on work surface, remove the four cap screws from the printhead mounting block (see exploded diagram for screw sizes).



Flushing the XJ500 Printhead



Figure 72: Syringe with Filter for Flushing



Figure 73: Flushing with Syringe

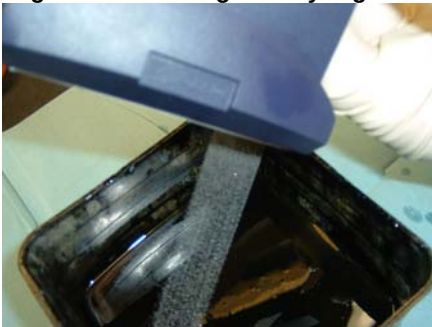


Figure 74: Cleaning Solution Streaming from Head

1. Syringe with filter for flushing
2. Flushing with Syringe
3. Cleaning Solution Streaming from Head



XJ-500 Head Solvent Based Notes:

Daily Shut Down:

The system may be left on or simply turned off. Either way, there is no need to flush. Capping the printhead is optional.

Daily Print Head Maintenance:

During start up, if any lines are missing in the print field, prime the printhead using the hand pump a couple of times.

No wiping is necessary. **DO NOT** wipe the nozzle face as this can cause irreparable damage. Simply let the excess ink drain into the head shell and then into the waste bottle.

Flushing with cleaner:

Flush with cleaner only if necessary, generally determined by a clogged print head. Starting with the ink line labeled number 1, remove the black tube fitting. Attach a syringe filled with cleaner to the fitting located on the print head and flush slowly cleaner. Cleaner will stream from only the top quarter of the head associated with the ink input port being used. Run one full syringe through the print head. Refill the syringe and repeat the same procedure on each fitting leading into the print head. A vacuum prime is generally necessary after flushing the print head

Solvent Incompatibility:

Fluids used for cleaning print heads, either for flushing out as a post manufacture stage or for displacing ink during testing, **MUST** be compatible with the inks and the print head. The manufacturer **MUST** supply any fluids introduced into the print head.

Your Inkjet printer inks are not compatible with many common solvents, for example IPA, acetone and water. When these polar solvents are mixed with the ink, the pigment or dye may coagulate. This may cause blockages and lead to print head failure or permanent damage. **Be certain that you use the correct solution for the ink.** The use of unauthorized or incompatible fluids can have a catastrophic effect. Solvent-based inks require solvent-based cleaners.



IDS2-500 Ink System Circuit Board Schematic, I/O

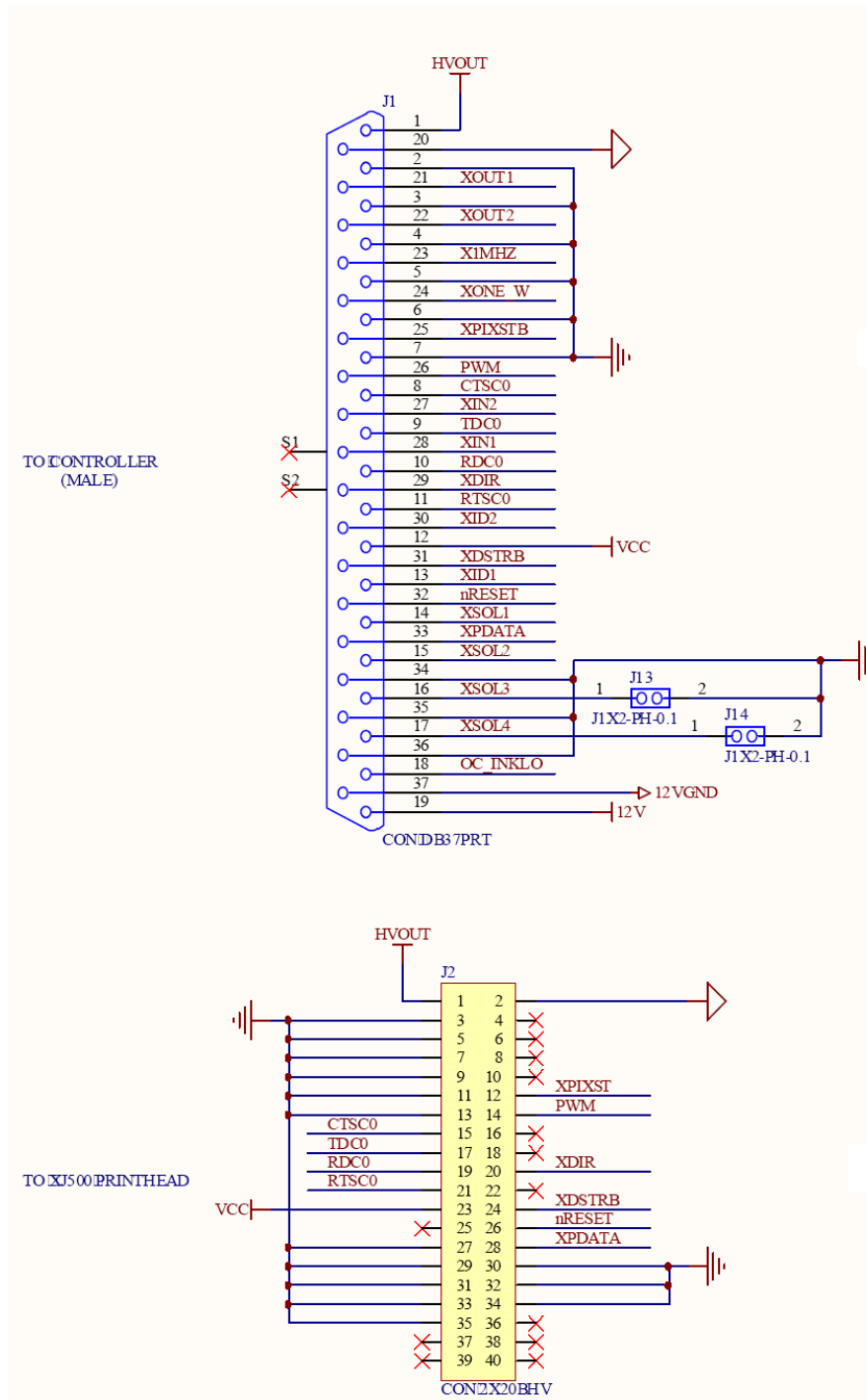
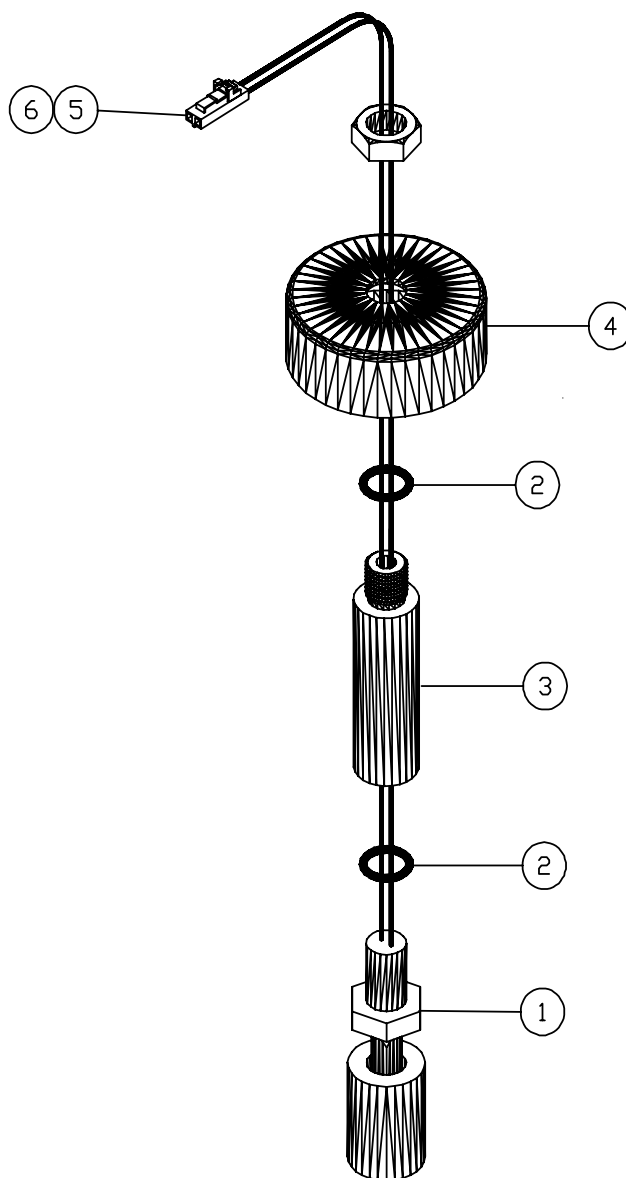


Figure 75: IDS2-500 Ink System Circuit Board Schematic, I/O



Drawing, Ink Level Sensor Assembly, IDS2/500 revision



6	2	CN10001001	TERMINAL, BOX/CRIMP
5	1	CN10000601	HOUSING, CONNECTOR, 2 CIRCUIT
4	1	PM10000301	NALGENE LID, MODIFIED
3	1	PM10000401	EXTENSION, SENSOR
2	2	PM10000601	O RING, AFLAS, 2-012
1	1	EC10000101	SENSOR
ITEM	QUANTITY	PART NUMBER	DESCRIPTION

Figure 76: Exploded Drawing, Chassis, IDS2/500 Ink Delivery System (PM20000201)

5. XJ500 Print Module



Wiring Diagram, IDS2/500 Print Module, Old

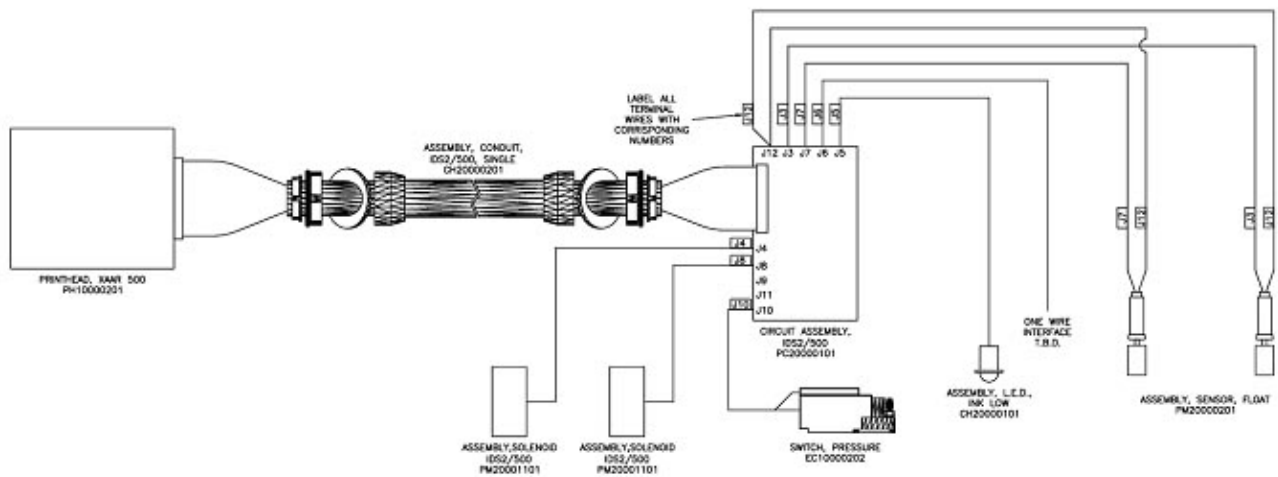
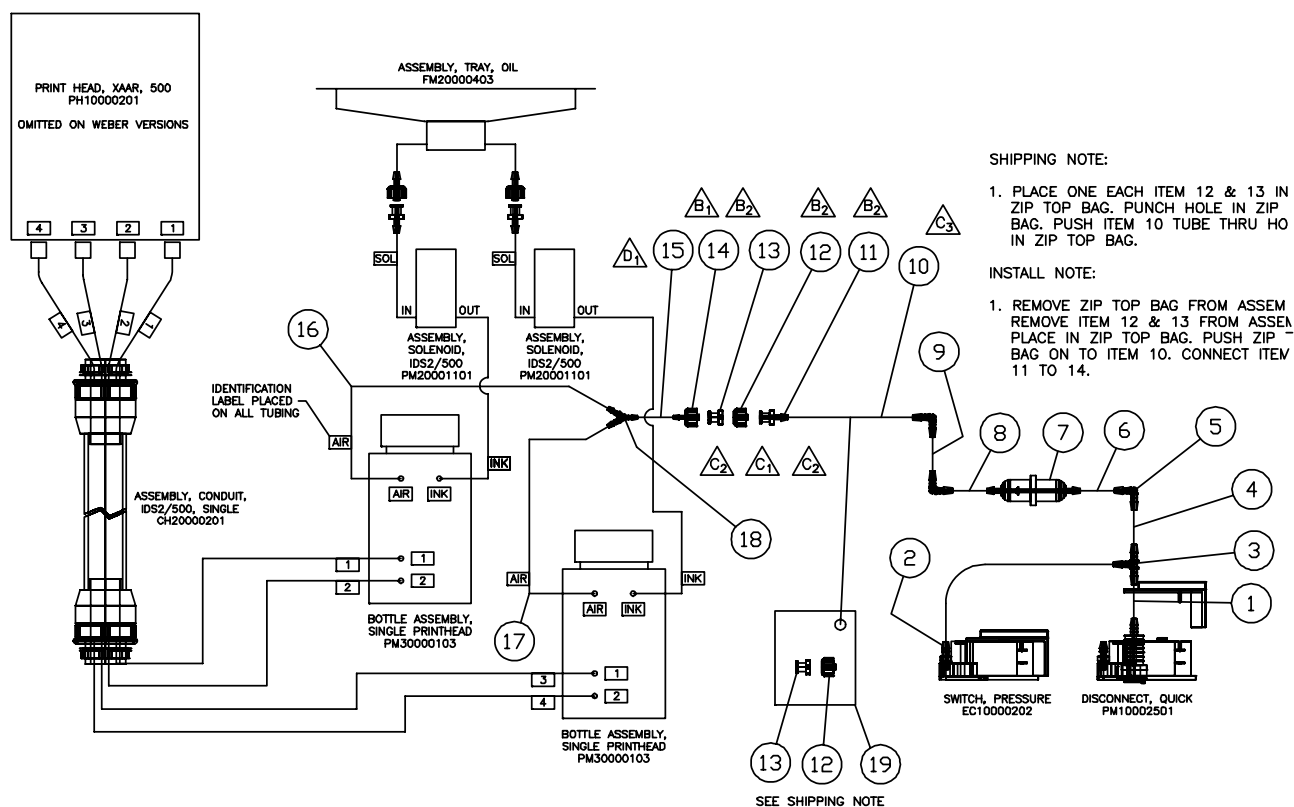


Figure 77: Wiring Diagram: IDS2/500 Print Module, Old (ES30000102)



Plumbing Diagram, IDS2/500



10	4"	PM10001601	TUBING, BEV-A-LINE V				
9	7/8"	PM10001601	TUBING, BEV-A-LINE V	19	1	PAF20203	SMALL ZIP TOP BAG
8	7/8"	PM10001601	TUBING, BEV-A-LINE V	18	1	PM10003801	CONNECTOR, Y
7	1	PM10003301	FILTER, 10 MICRON, 1/8" X 1/8" BARB	17	15"	PM10003601	TUBING 3/32" I.D.
6	7/8"	PM10001601	TUBING, BEV-A-LINE V	16	15"	PM10003601	TUBING 3/32" I.D.
5	3	PM10003201	FITTING, ELBOW 1/8", BARB	15	2"	PM10003601	TUBING 3/32" I.D.
4	7/8"	PM10001601	TUBING, BEV-A-LINE V	14	1	PM10003501	LUER, TWISTLOCK, MALE
3	1	PM10003101	FITTING, TEE 1/8", BARB	13	2	PM10004101	LUER, CAP, FEMALE
2	4 1/8"	PM10003901	TUBING, TYGON, 1/8" I.D. X 1/4" O.D.	12	2	PM10004201	LUER, CAP, MALE
1	7/8"	PM10001601	TUBING, BEV-A-LINE V	11	1	PM10001701	LUER, TWISTLOCK, FEMALE
ITEM	QUANTITY	PART NUMBER	DESCRIPTION	ITEM	QUANTITY	PART NUMBER	DESCRIPTION

Figure 78: Plumbing Diagram, IDS2/500 (PM30000203)



6. XJ128 Print Module



The XJ128 Print Module consists of two major components:

- The IDS128 Ink Delivery System (Ink Circuit)
- The Xaar, XJ128 Printhead

Maintenance

With Oil Based Inks

Using oil based inks to print strictly onto porous substrates; there is virtually no maintenance necessary. Since oil based ink dries by absorption only, ink can be left inside the printhead for very long periods of time (weeks, even months). After periods as long as this at most a slight amount of priming (2-3 pumps) may be necessary.

Once the printhead is primed, the printer should keep running as long as you put ink into it.

Annual:

- Change the Ink Filter and O-rings underneath the ink tray.

As needed:

- Install new ink
- Pressure prime the printhead

Trouble Shooting

With Oil Based Inks

****Comments that apply to solvent based inks.***

Symptom: Ink will not prime into print head.

<u>Possible cause</u>	<u>Possible solution</u>
• Shipping seal not removed from nozzle face.	Remove the shipping seal from the nozzle face.
• Ink system will not hold air pressure when pumped	Re-seat lid and make sure that it seals.
• Clogged Ink Fill Needle.	Sometimes a small piece of the rubber septum can tear off when a new ink bag is inserted, clogging the needle. Remove the ink bag and poke a paper clip or small wire into the needle from the top. If there is debris inside the needle, this action will loosen it and it will fall into the ink filter. This is ok and will not harm performance.
• Ink Bag empty	Check ink bag. If empty, replace.

Symptom: Print quality is degraded, i.e. missing lines (dots), spattered print (satellites), sections of the printed image missing.



<u>Possible cause</u>	<u>Possible solution</u>
Too much throw distance	Make sure that proper product handling is in place and that guide rails are adjusted to that the product is within 1-5mm, especially if printing barcodes.
Printhead has ingested air.	Pressure priming the XJ128 by pumping the 2-3 times is usually adequate to recover the nozzles. Repeat if necessary.
Printhead Starvation	Starvation can occur if the printhead has been raised to much in relationship to the IDS. The brackets have marking on them and the dimensions are called out in the user manual and in this manual. Lower the printhead according to the markings on the brackets. Starvation can also occur under extremely high through put. Meaning, very fast line speed, coupled with fast print repetition rate and large message. If the printhead cannot maintain prime under these circumstances, the printhead may be lowered slightly until it will maintain prime. To get a true reading, a vacuum prime will be necessary each time the printhead loses prime.
Printhead flooding (weeping)	The printhead will weep if it is adjusted too low in relation to the IDS. Raise the head according to the bracket markings. Positive pressure will also cause weeping. This is evident if you see the head dripping.
Debris stuck to nozzle plate	Sometimes in very dirty, dusty conditions, debris can land on the nozzles and stick to the wet ink on the nozzle plate causing some nozzles to become deflected. Pressure prime the printhead with 2-3 pumps to displace the debris and clear nozzles.
Printhead clogged	The printhead could be internally clogged, but this is very rare. See section below on "Flushing Printheads" to attempt to recover the clogged nozzles.
Printhead or section of printhead dead	It is possible although rare for a printhead to fail electrically. If a complete section of nozzles is out and you cannot recover any of them by priming or vacuum priming, there is a good chance that an ASIC inside the printhead has failed. In this case, the printhead must be replaced.
*Scabbing, nozzles crusted over with dried ink.	This only happens with solvent base. To recover, pressure prime for 2-3 pumps. Make sure that the Voltage-Spit/Buzz settings are appropriate for the ink type.



Priming the XJ128 Printhead



Figure 79: Loosen 128 Nozzle Plate Screws

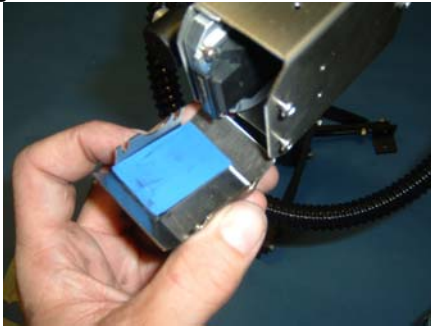


Figure 80: Remove Nozzle Plate



Figure 81: Prepare to Print



Figure 82: Close the Air Valve

1. Loosen screws holding nozzle protector plate.
2. Remove the nozzle protector plate
3. With printhead exposed, prepare to prime the printhead for the first time.
4. Close the air valve on the priming pump by rotating clockwise



Figure 83: Pump the Priming Bulb



Figure 84: Hold Lint Free Wipe Up to Nozzle

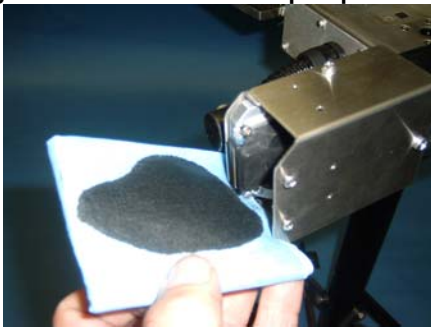


Figure 85: Blot Excess Ink Off Printhead

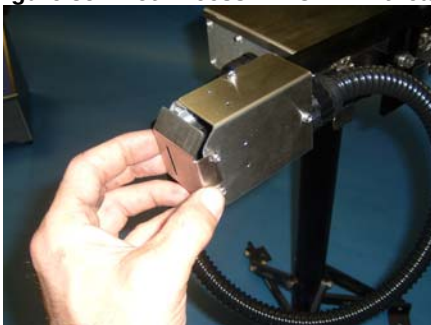


Figure 86: Re-attach Nozzle Plate

5. Pump the priming bulb continuously for 10 seconds.
6. Be sure to turn the air valve back counter clockwise to release the pressure when finished priming.
7. Hold a Lint Free wipe up to the nozzles while priming.
8. Gently blot the excess ink away from the face of the printhead using only factory-approved lint free wipes.
*Never wipe or rub the nozzle plate. Only blot. Never touch the nozzle plate with anything other than factory approved wipes.
9. Re-attach the nozzle protector plate.



Figure 87: Tighten Nozzle Plate Screws



Figure 88: Priming into Container



Figure 89: Quick Prime

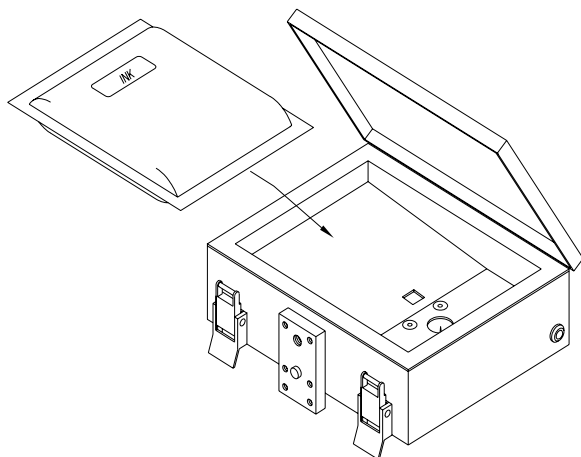
10. Press the nozzle cover flush up against the nozzles and tighten the screws.

11. Another method is to prim into a container, then blot the excess ink away.

**Note: Once the printhead has been initially primed an occasional quick prime 2-3 pumps is necessary to clear a nozzle. To perform this quick prime, it is not necessary to remove the nozzle protector plate. Simply prime the head and let the ink drip through the gap in the bottom of the head shroud into a wipe (towel) or container.*



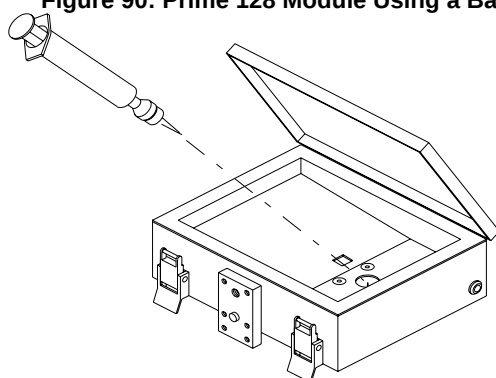
Procedures for Cleaning a Clogged Printhead (XJ128)



Flushing XJ128 Print Module using a bag of flushing solution. This procedure flushes the entire print module but is the easiest way. This is the only recommended method to flush when using pigmented inks.

***DO NOT USE THIS METHOD WITH THE XJ500**

Figure 90: Prime 128 Module Using a Bag



Flushing XJ128 Print Module using syringe.

***DO NOT USE THIS METHOD WITH THE XJ500**

Figure 91: Prime 128 Module Using a Syringe



Cleaning a Severe Clog:



If flushing does not work, this is the last resort.
A print head can be cleaned using an ultrasonic cleaner.

1. Remove the entire print head shell. Do not remove the print head.
2. Fill the cleaning syringe with approved solvent.
3. Attach the cleaning syringe to the ink line fitting on the outside of the head shell.
4. Flush a small amount solvent through the print head.
5. Place the print head assembly (upright) into a container filled to 1 inch with clean solvent.
6. Place this container into the ultrasonic cleaner. The ultrasonic cleaner should be filled with water.
7. Run the cleaner for 30 minutes and remove the print head. *Do not exceed 30 minutes with ultrasonic cleaner on. However, the printhead may soak for up to 3 hours with the USC off. Leaving on for too long causes significant heat that softens some of the potting compounds in and around the head.*
8. Reinstall print head immediately and follow procedures for priming the print head.



Figure 92: Cleaning a Severe Clog



Removing/Installing the XJ128 Printhead



Figure 93: Remove Front and Side Covers



Figure 94: Pull Off Ink Tubing

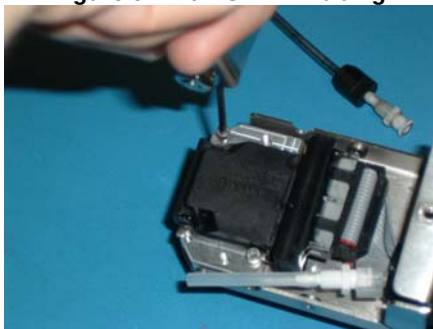


Figure 95: Remove Screws Holding 128 Printhead



Figure 96: Disconnect Lure Fittings

1. Remove the front and side covers.
2. Pull off the ink tube using thumb and forefinger.
3. Using a hex key, remove each of the four screws holding the printhead in place.
4. Twist the luer fitting counter clock wise to loosen and disconnect the ink tubes.



Figure 97: Pull Printhead Out



Figure 98: Remove Connector



Figure 99: Re-Attach the Printhead



Figure 100: Re-Attach Covers and Test Printhead

5. Pull out the printhead so that you can get a good grip to remove the electrical connector.
6. Remove the connector and pull the printhead away.
7. Re-attach the printhead by re-connecting the ink tubes and the reversing steps 6 through 1.
8. At this point, you are ready to re-attach the covers and test the printhead.

Schematic, I/O PCB, IDS-128 Ink System

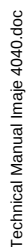


Figure 101: Schematic, I/O PCB, IDS-128 Ink System



Electrical Diagram, IDS2/128

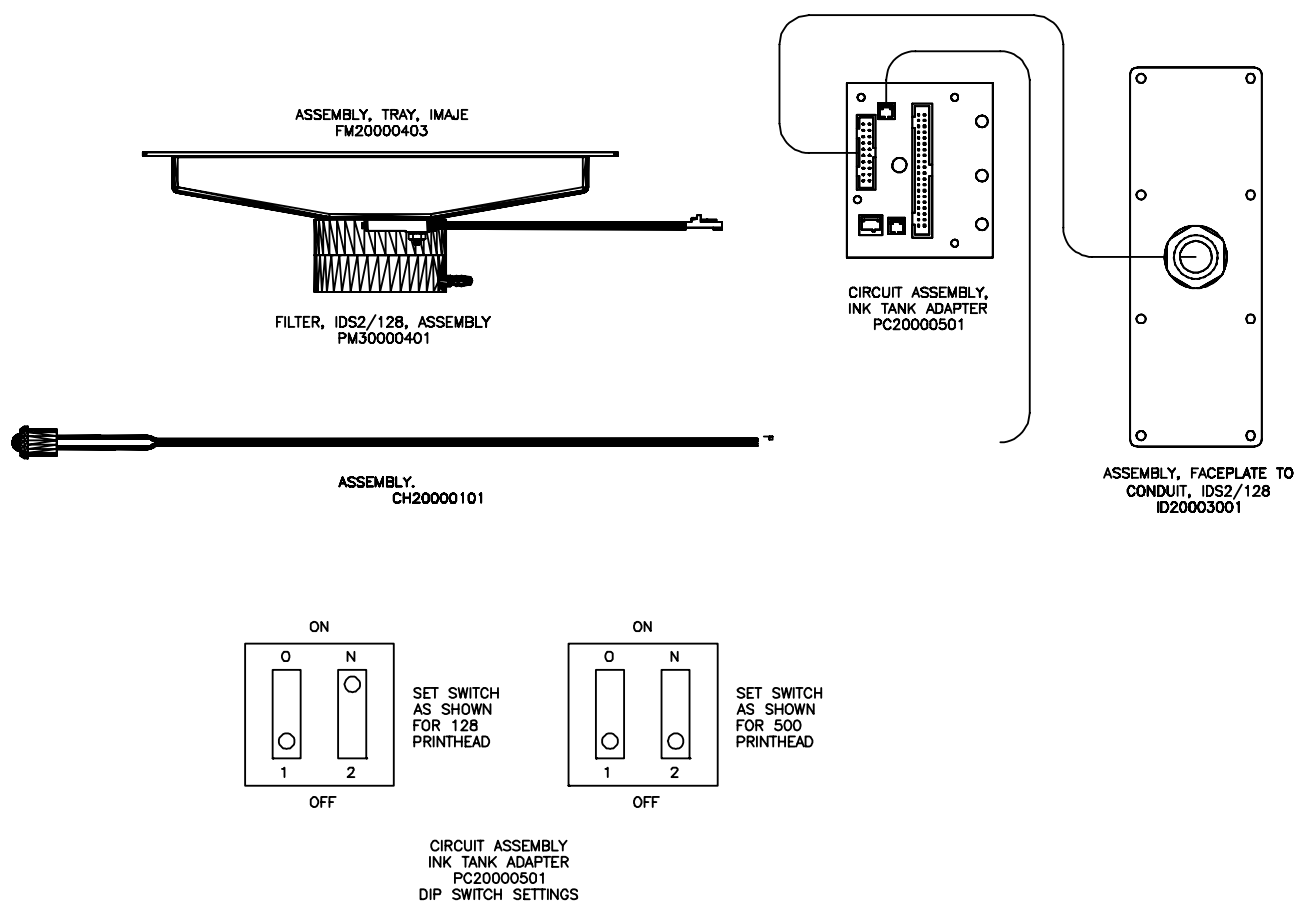
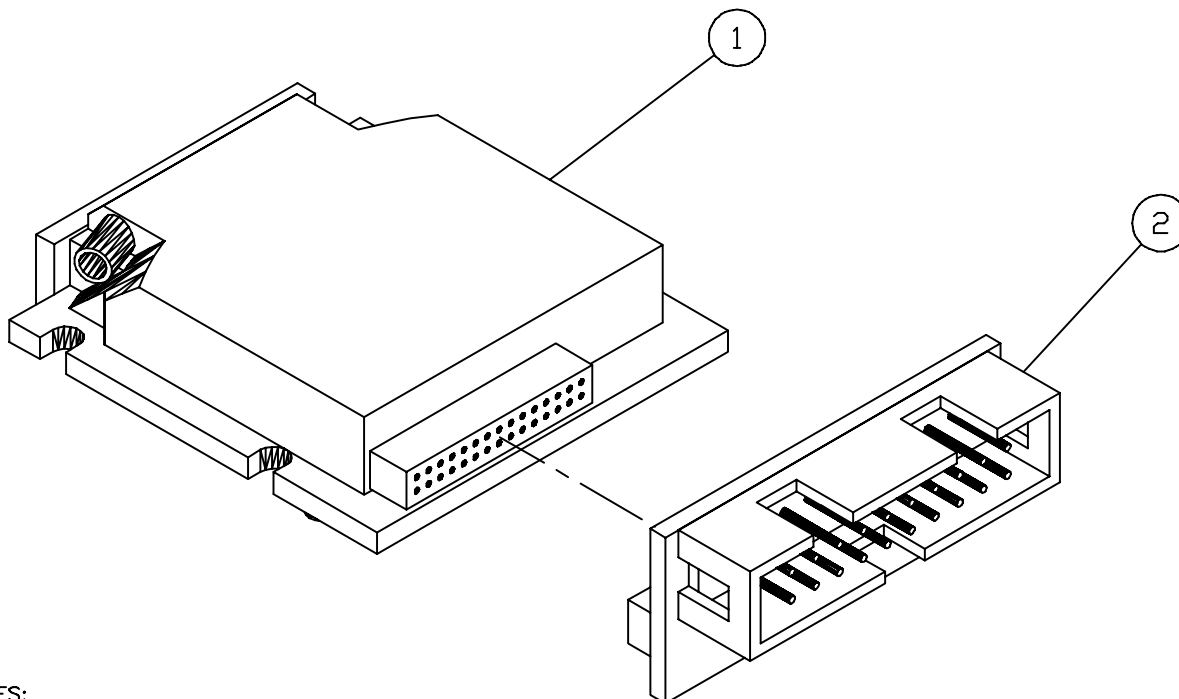


Figure 102: Electrical Diagram, IDS2/128 (ES20000201)



Drawing, Replacement Printhead, XJ128

3	1	PM20001801	128 PRINthead TUBING AND FITTING KIT
2	1	BJ-4921	INTER. PCB ASS'Y
1	1	BJ-4926	PRINthead BJ-4 128 DOT
ITEM	QUANTITY	PART NUMBER	DESCRIPTION



NOTES:

1. SUPPLIER OF 3M JET MELT 3784 Q 11 LB IS:

R.S. HUGHES CO., INC.
2107 E. MAGNOLIA
PHOENIX, AZ 85034
TEL; (602) 275-5565
FAX: (602) 275-5025

2. WIPE DOWN ITEM 1 AND ITEM 2 WITH SOLVENT SO THAT 3M JET MELT HAS A CLEAN SURFACE TO ADHERE TO.

3. ATTACH ITEM 1 TO ITEM 2 AS SHOWN.

4. APPLY 3M JET MELT TO OUTER CONNECTION BETWEEN ITEM 1 AND 2.

5. APPLY 3M JET MELT TO ALL PCB COMPONENT PIN ENDS.

6. ITEM 3 IS IN A ZIP TOP BAG AND IS NOT SHOWN FOR CLARITY.

7. PLACE ALL ITEMS IN A STATIC SHIELD BAG AND HEAT SEAL OPENING.

8. PLACE PART NUMBER AND DESCRIPTION LABEL ON BAG.

9. BJ-4902 OLD FAS-CO NUMBER

Figure 103: Drawing, Replacement Printhead, XJ128 (PH20000401)



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