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Compliance Information

For Customers in the European Union

This equipment displays the CE mark to indicate conformance to the following legislation:

**EU EMC Directive 2014/30/EU:**
Essential health and safety requirements relating to electromagnetic compatibility.

- **EN 61000-6-4**  Generic Emissions Standard for Heavy Industrial Environments
- **EN 61000-3-2**  Harmonic Current Fluctuations
- **EN 61000-3-3**  Voltage Fluctuation and Flicker
- **EN 61000-6-2**  Generic standards - Immunity for industrial environments

**EC Low Voltage Directive 2014/35/EU**
Essential health and safety requirements relating to electrical equipment designed for use within certain voltage limits.

- **EN 60950-1**  Safety requirements for information technology equipment including electrical business equipment.
- **EN 60529**  Degrees of protection provided by enclosures.

For Customers in the USA

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

⚠️ WARNING ⚠️

**PERSONAL INJURY.**

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference, when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded cables must be used with this unit to ensure compliance with Class A FCC limits.

This equipment has been tested and certified for compliance with U.S. regulations regarding safety and electrical emissions.

This equipment has been investigated in accordance with the standard for safety: UL 60950-1: Safety of information technology equipment.
For Customers in Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This equipment has been tested and certified for compliance with Canadian regulations regarding safety and electrical emissions.

This equipment has been investigated in accordance with the standard for safety: CAN/CSA C22.2 No. 60950-1-03. Safety of information technology equipment.

Pour la clientèle du Canada

Le présent appareil numérique n’émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numérique de las class A prescrites dans le Reglement sur le brouillage radioélectrique edicte par le ministere des Communications du Canada.

Cet équipement est certifié CSA.

This equipment has been investigated in accordance with the standard for safety: CAN/CSA C22.2 No. 60950-1-03. Safety of information technology equipment.

⚠️ WARNING ⚠️

PERSONAL INJURY.

This product is not intended for use in the immediate/direct visual field of the display work place. To avoid disturbing reflections on the display work place, this product shall not be placed in the immediate/direct field of vision.
Support and Training

Contact Information

If you have any questions or need assistance, please contact at 1-800-843-3610 (for all customers within the United States). Outside the U.S., customers should contact their distributor or subsidiary for assistance.

Videojet Technologies Inc.
1500 Mittel Boulevard
Wood Dale, IL 60191-1073 U.S.A.
Phone: 1-800-843-3610
Fax: 1-800-582-1343
International Fax: 630-616-3629
Web: www.videojet.com

Service Program

Videojet service and support programs are designed to protect your investment in Videojet printers and deliver the lowest total cost of ownership to your operations.

Videojet offers comprehensive service programs, spare parts and training - all designed to help you keep your lines up and running.

• A complete array of customer services and offerings tailored to meet your operational needs
• A program designed to maximize your equipment uptime, allowing you to focus on your most important mission - your company’s productivity
• A product and service program to support and deliver your ultimate purchase: a high quality, reliable printed code on your finished product.

Customer Training

If you wish to perform your own service and maintenance on the printer, Videojet Technologies Inc. recommends you complete a Customer Training Course on the printer.

Note: The manuals are intended to be supplements to (and not replacements for) Videojet Technologies Inc. Customer Training.

For more information on Videojet Technologies Inc. Customer Training Courses, call 1-800-843-3610 (within the United States only). Outside the U.S., customer should contact a Videojet subsidiary office or the local Videojet distributor for further information.
Section 1  Introduction

This chapter contains the following informations:

- Videojet 1860 Printer
- About the Manual
- Related Publications
- Content Presentation
- User Interface Terminology
- Abbreviations and Acronyms
- Chapters in this Manual

1.1 Videojet 1860 Printer

The Videojet 1860 printer is a continuous ink jet printer that can print fixed and variable codes at high line speeds on consumer and industrial products. The printer delivers superior uptime, print quality, and ease of use to the operators. The Videojet 1860 printer is as shown in the Figure 1-1.

1.2 About the Manual

The Videojet 1860 Service Manual is written for the service technician of the printer. The Service Manual contains the installation, service, and troubleshooting procedures.

Figure 1-1: Videojet 1860 Printer
Introduction

1.3 Related Publications

The Videojet 1860 Operator Manual (Part Number: 462651) is available for reference.

1.3.1 Language Codes

When you order these manuals, make sure that you add the 2-digit language code at the end of the part number. For example, the part number of the Spanish version of the service manual is 462652-04. Use the list of language codes shown in Table 1-1 to identify the translated versions of the manual.

Note: Availability of the operator manual is indicated by an asterisk (*). Availability of the service manual is indicated by a plus sign (+). Contact the Videojet distributor or subsidiary for more information.

<table>
<thead>
<tr>
<th>Code</th>
<th>Language</th>
<th>Availability (see Note:)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>English (US)</td>
<td>*</td>
</tr>
<tr>
<td>02</td>
<td>French</td>
<td>*</td>
</tr>
<tr>
<td>03</td>
<td>German</td>
<td>*</td>
</tr>
<tr>
<td>04</td>
<td>Spanish</td>
<td>*</td>
</tr>
<tr>
<td>05</td>
<td>Portuguese Brazilian</td>
<td>*</td>
</tr>
<tr>
<td>06</td>
<td>Japanese</td>
<td>*</td>
</tr>
<tr>
<td>07</td>
<td>Russian</td>
<td>*</td>
</tr>
<tr>
<td>08</td>
<td>Italian</td>
<td>*</td>
</tr>
<tr>
<td>09</td>
<td>Dutch</td>
<td>*</td>
</tr>
<tr>
<td>10</td>
<td>Chinese (Simplified)</td>
<td>*</td>
</tr>
<tr>
<td>11</td>
<td>Arabic</td>
<td>*</td>
</tr>
<tr>
<td>12</td>
<td>Korean</td>
<td>*</td>
</tr>
<tr>
<td>13</td>
<td>Thai</td>
<td>*</td>
</tr>
<tr>
<td>15</td>
<td>Norwegian</td>
<td>*</td>
</tr>
<tr>
<td>16</td>
<td>Finnish</td>
<td>*</td>
</tr>
<tr>
<td>17</td>
<td>Swedish</td>
<td>*</td>
</tr>
<tr>
<td>18</td>
<td>Danish</td>
<td>*</td>
</tr>
<tr>
<td>19</td>
<td>Greek</td>
<td>*</td>
</tr>
<tr>
<td>20</td>
<td>Hebrew</td>
<td>*</td>
</tr>
<tr>
<td>21</td>
<td>English (UK)</td>
<td>*</td>
</tr>
<tr>
<td>23</td>
<td>Polish</td>
<td>*</td>
</tr>
<tr>
<td>24</td>
<td>Turkish</td>
<td>*</td>
</tr>
<tr>
<td>25</td>
<td>Czech</td>
<td>*</td>
</tr>
<tr>
<td>26</td>
<td>Hungarian</td>
<td>*</td>
</tr>
</tbody>
</table>

Table 1-1: Language Codes
1.4 Content Presentation

This manual contains different types of information like safety guidelines, additional notes, User Interface (UI) terminology and so on. To help you to identify the different types of information, different writing styles are used. This section describes these writing styles.

1.4.1 The Word ‘Printer’

The word ‘printer’ indicates the Videojet 1860 printer, from this point onwards, in this manual.

1.4.2 Positional References

Unless stated to the contrary, positions and directions such as left, right, front, rear, to the right and to the left are given with respect to the printer when viewed from the front.

1.4.3 Units of Measurement

This manual uses metric units of measurement. The equivalent English measures are included in parenthesis. For example, 240 mm (9.44 inches).

*Note: The default date display format is UK (day/month/year) for Videojet 1860 UI.*

1.4.4 Safety Information

The safety information includes warning and caution statements.

1.4.4.1 Warning

The warning statements indicate hazards or unsafe practices that can result in personal injury or death.

For example:

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERSONAL INJURY.</td>
</tr>
<tr>
<td>The cleaning agent is poisonous if taken internally. Do not drink. Seek medical attention immediately if ingested.</td>
</tr>
</tbody>
</table>

1.4.4.2 Caution

The caution statements indicate hazards or unsafe practices that can result in damage to the equipment.

For example:

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQUIPMENT DAMAGE.</td>
</tr>
<tr>
<td>Do not fit or remove any connector on the printer when the power is on, otherwise the printer may get damaged.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Language</th>
<th>Availability (see Note:)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>Vietnamese</td>
<td>*</td>
</tr>
<tr>
<td>34</td>
<td>Bulgarian</td>
<td>*</td>
</tr>
<tr>
<td>55</td>
<td>Romanian</td>
<td>*</td>
</tr>
</tbody>
</table>

Table 1-1: Language Codes (continued)
1.4.4.3 Notes

Notes provide additional information about a particular topic.

For example:

*Note: This button is displayed on the status bar when Start Jets is selected.*

1.5 User Interface Terminology

For more information on operating system, refer [Chapter 6, “User Interface”](#).

![Figure 1-2: Menu Screen](image)

1.6 Abbreviations and Acronyms

Table 1-2 describes the abbreviations and acronyms included in this manual.

<table>
<thead>
<tr>
<th>Abbreviation/Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI</td>
<td>User Interface</td>
</tr>
<tr>
<td>PCB</td>
<td>Printed Circuit Board</td>
</tr>
<tr>
<td>MSDS</td>
<td>Material Safety Data Sheet</td>
</tr>
</tbody>
</table>

*Table 1-2: Abbreviations and Acronyms*
Introduction

1.7 Chapters in this Manual

Table 1-3 provides the list of chapters in this service manual.

<table>
<thead>
<tr>
<th>Chapter No.</th>
<th>Chapter Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduction</td>
<td>Contains the information about this manual, related publications, and writing styles used in this manual.</td>
</tr>
<tr>
<td>2.</td>
<td>Safety</td>
<td>Contains the safety and hazard information.</td>
</tr>
<tr>
<td>3.</td>
<td>Main Parts</td>
<td>Contains the description the main parts of the printer.</td>
</tr>
<tr>
<td>4.</td>
<td>Installation</td>
<td>Explains the installation procedures of different parts of the printer.</td>
</tr>
<tr>
<td>5.</td>
<td>Printer Operation</td>
<td>Contains the information on how to use the UI to setup and operate the printer.</td>
</tr>
<tr>
<td>6.</td>
<td>User Interface</td>
<td>Explains how to use the UI to create and save jobs.</td>
</tr>
<tr>
<td>7.</td>
<td>Replacement Instructions</td>
<td>Explains the procedures to remove and replace the parts of the printer.</td>
</tr>
<tr>
<td>8.</td>
<td>Maintenance</td>
<td>Provides the maintenance and cleaning procedures of the printer.</td>
</tr>
<tr>
<td>9.</td>
<td>Troubleshooting</td>
<td>Contains diagnostic and troubleshooting procedures.</td>
</tr>
<tr>
<td>10.</td>
<td>Appendix A</td>
<td>Describes the clean start and clean stop procedures.</td>
</tr>
<tr>
<td>11.</td>
<td>Appendix B</td>
<td>Contains the encoder setup information.</td>
</tr>
<tr>
<td>12.</td>
<td>Appendix C</td>
<td>Describes the MCB Test Points.</td>
</tr>
<tr>
<td>13.</td>
<td>Appendix D</td>
<td>Contains the COMET menu structure.</td>
</tr>
</tbody>
</table>

Table 1-3: Chapters in the Manual
Section 2  Safety

This chapter contains the following informations:

- Introduction
- General Safety Guidelines
- Electrical Safety Guidelines
- Fluid Safety Guidelines
- Compressed Air Safety Guidelines
- UI Related Safety Guidelines
- Other Important Guidelines

2.1 Introduction

The policy of Videojet Technologies Inc. is to manufacture non-contact printing/coding systems and ink supplies that meet high standards of performance and reliability. We enforce strict quality control techniques to eliminate the potential for defects and hazards in our products.

The intended use of the Videojet Eclipse printer is to print information directly onto a product. Use of this equipment in any other fashion may lead to serious personal injury.

The safety guidelines provided in this chapter are intended to educate the technicians on all safety issues, so that the printer is serviced and operated in a safe manner.

2.2 General Safety Guidelines

- Always refer to the correct service manuals as per the specific Videojet printer model.
- Only Videojet-trained personnel must carry out installation and maintenance work. Any such work undertaken by unauthorized personnel may damage the printer and will invalidate the warranty.
- To avoid damage to the printer components, use only soft brushes and lint-free cloth for cleaning. Do not use high pressure air, cotton waste, or abrasive materials.
- The printhead must be completely dry before attempting to start the printer, otherwise the printhead may get damaged.
- Do not fit or remove any connector on the printer when the power is turned on, otherwise the printer may get damaged.
2.3 Electrical Safety Guidelines

This section explains the safety guidelines related to electrical power supply, electrical cables, fuses, bonding, and grounding.

2.3.1 Electrical Power Supply

⚠️ WARNING
PERSONAL INJURY.
Lethal voltages are present within this equipment when it is connected to the mains electrical supply. Only trained and authorized personnel must carry out the maintenance work.

⚠️ WARNING
PERSONAL INJURY.
Observe all statutory electrical safety codes and practices. Unless it is necessary to run the printer, disconnect the printer from the mains electrical supply before removing the covers or attempting any service or repair activity. Non-adherence to this warning can result in death or personal injury.

⚠️ WARNING
PERSONAL INJURY.
A high AC voltage is present at the inverter and backlight. Extreme caution is required when diagnosing failure in these areas.

2.3.2 Electrical Cables

⚠️ WARNING
PERSONAL INJURY.
Use only the mains power cable supplied with the printer. The end of this cable must have an approved, three-pole, mains plug that has a protective ground conductor.

- The electrical power cables, sockets and plugs must be kept clean and dry.
- For pluggable equipment, the socket-outlet must be installed near the equipment and must be easily accessible.

⚠️ WARNING
PERSONAL INJURY.
Always inspect the cables for damage, wear, corrosion, and deterioration. Make all grounding/bonding connections void of areas of paint, ink build-up, and corrosion.
2.3.3 Bonding and Grounding

⚠️ WARNING

PERSONAL INJURY.
The printer must be connected only to an AC power supply that has a protective ground conductor and must be according to IEC requirements or applicable local regulations.

⚠️ WARNING

PERSONAL INJURY.
Do not use the printer if there is any interruption in the protective ground conductor or if the protective ground conductor is disconnected. The failure to follow this warning can cause an electrical shock.

⚠️ WARNING

PERSONAL INJURY.
Always ground conductive equipment to an earthing electrode or to the building grounding system with approved cables as per NEC standards in order to drain all potential static discharge. For example, a metal service tray to earth ground.

⚠️ WARNING

PERSONAL INJURY.
A resistance reading from the grounded service tray to the equipment chassis or mounting bracket should be 0 to less than 1 ohm. A resistance check should be made using a safe and reliable ohmmeter and should be done on a frequent basis.

⚠️ WARNING

PERSONAL INJURY.
The PCBs contain static sensitive devices. A suitably grounded, antistatic wrist strap must be worn when working on or handling PCBs.

⚠️ WARNING

PERSONAL INJURY.
Always prevent static discharge from occurring. Use proper Grounding and Bonding methods. Only use Videojet approved metallic service trays and ground cables.

⚠️ WARNING

PERSONAL INJURY.
Always bond conductive equipment together with approved cables to maintain them at the same potential and minimize static discharge. For example, printhead to metal service tray.
2.3.4 Fuses

⚠️ WARNING
PERSONAL INJURY.
The Optional Wash Station has been solely designed for the cleaning of the printhead.
- Do not use it for purging or printing operations or for any other purposes.
- Always ensure that the jet is stopped and that any hazardous voltages are switched off prior to the commencement of the printhead wash down.

⚠️ CAUTION
EQUIPMENT DAMAGE.
Always empty the service trays frequently. Some inks and cleaning solutions are flammable. Make sure that the waste fluids are disposed according to HAZMAT.

2.4 Fluid Safety Guidelines

This section describes the hazards that may occur while handling ink, make-up fluid, cleaning solutions, and the safety precautions that a user must take to prevent hazards.

2.4.1 Read the Material Safety Data Sheets
Read and understand the Material Safety Data Sheet (MSDS) before using any ink, make-up fluid, or cleaning solution. An MSDS exists for each type of ink, make-up fluid, and cleaning solution. For more information, visit [www.videojet.com](http://www.videojet.com) and navigate to Documentation > Material Safety Data Sheets.
2.4.2 Ink/Make-up/Cleaning Solution

⚠️ WARNING
PERSONAL INJURY.
The ink, make-up fluid and cleaning solution are irritating to the eyes and respiratory system. To prevent personal injury when handling these substances:

- Always wear protective clothing and rubber gloves.
- Always wear goggles with side-shields or a face mask. It is also advisable to wear safety glasses when carrying out maintenance.
- Apply barrier hand cream before handling ink.
- If ink or make-up or cleaning solution contaminates the skin, wash immediately with soap water. DO NOT use washdown or solvent to clean ink stains from the skin.
- If cleaning solution contaminates the skin, rinse off with running water for at least 15 minutes.

⚠️ WARNING
PERSONAL INJURY.
The ink, make-up fluid and cleaning solution are volatile and highly flammable. They must be stored and handled in accordance with local regulations.

- Do not smoke or use a naked flame in the vicinity of these substances.
- Immediately after use, remove any tissue or cloth that becomes saturated with these substances. Dispose all such items in accordance with the local regulations.
- In the event that any ink or make-up or cleaning solution container is not completely empty after use, it should be resealed. Only full bottles are recommended for use when replenishing ink or make-up or cleaning solution; partially filled bottles must be disposed in accordance with the local regulations.

⚠️ WARNING
PERSONAL INJURY.
When setting up the nozzle, direct the ink stream into a beaker or suitable container. To avoid the contamination of the ink, do not re-use any ink collected in this way. Dispose all waste ink in accordance with the local regulations.

⚠️ WARNING
PERSONAL INJURY.
Prolonged breathing of make-up fluid or cleaning fluid vapor may cause drowsiness and/or effects similar to alcoholic intoxication. Use only in open, well-ventilated areas.

⚠️ WARNING
PERSONAL INJURY.
The cleaning agent is poisonous if taken internally. Do not drink. Seek medical attention immediately if ingested.
2.5 Compressed Air Safety Guidelines

**WARNING**
PERSONAL INJURY.
Airborne particles and substances are a health hazard. Do not use high pressure compressed air for cleaning purposes.

2.6 UI Related Safety Guidelines

**CAUTION**
RISK OF DATA LOSS.
Ensure that the required job is loaded each time before entering the print mode especially after printer power off.

**CAUTION**
DATA SECURITY.
To prevent unauthorized access to the software, ensure that Logout button is selected when exiting from the current user level.
### 2.7 Other Important Guidelines

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERSONAL INJURY.</strong></td>
</tr>
<tr>
<td>If the battery is replaced by an incorrect type, it will lead to an explosion. Always dispose off the used batteries according to the instructions and local regulations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERSONAL INJURY.</strong></td>
</tr>
<tr>
<td>In a fault condition, heater can reach 70 °C. Do not touch the plate on which the heater is mounted. The failure to follow this warning can cause personal injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERSONAL INJURY.</strong></td>
</tr>
<tr>
<td>The ink system operates under pressure. Only trained and authorized personnel must carry out the maintenance work.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EQUIPMENT DAMAGE.</strong></td>
</tr>
<tr>
<td>After a Quick Stop, the machine should not be left in this state for any length of time as drying ink may make restarting difficult. Perform a nozzle backflush.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EQUIPMENT DAMAGE.</strong></td>
</tr>
<tr>
<td>The printhead must be completely dry before attempting to start the printer otherwise the EHT will trip.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EQUIPMENT DAMAGE.</strong></td>
</tr>
<tr>
<td>The printer should be placed directly on a flat or solid surface, or bolter to a Videojet supplied stand. In either case the printer must not be operated when tilted. Always keep the printer upright on flat surface.</td>
</tr>
</tbody>
</table>
Section 3  Main Parts

Introduction

This section contains the following information:

- Printer Overview
- Main Parts of the Videojet 1860 Printer

3.1 Printer Overview

Videojet 1860 printer is a continuous ink jet printer that can print fixed and variable codes at high line speeds on consumer and industrial products.

Figure 3-1 shows the schematic diagram of the printer.

[Diagram of System Overview]

Figure 3-1: System Overview
3.2 Main Parts of the Videojet 1860 Printer

The printer includes the following major parts as shown in Figure 3-2.

- Touch Screen Display
- Electronics Compartment
- Main Power Switch
- Ink Compartment
- Standard IO
- Expanded IO
- Mains Lead
- Umbilical
- Printhead

Figure 3-2: Main Parts of the Printer
3.2.1 Home Page

Figure 3-3 shows the Home Screen of the operator control system. Refer to User Interface chapter for more information.

![Figure 3-3: Home Screen](image)

1. Printer Status Bar
2. Message Preview
3. Consumables Information
4. Performance Information
5. Control Bar

3.2.2 Touch Screen Display

The touch screen display (see Figure 3-4) is mounted on the electronics compartment opening of the cabinet.

![Figure 3-4: Display Unit](image)
3.2.3 Electronics Compartment

Electronics compartment is located behind the touch screen display as shown in Figure 3-5, it consists of the following parts:

- Main Control Board (MCB)
- Electronics Compartment Fan
- Power Supply Unit
- Main Power Switch
- Expansion Board (optional)

Figure 3-5: Electronics Compartment
3.2.3.1 Main Control Board (MCB)

The Main Control Board (MCB) (see Figure 3-6) is located behind the display unit in the electronics compartment.

![Main Control Board (MCB) Connections](image)

1. Printhead 12 way Connector
2. External USB
3. PSU
4. SD Card
5. EHT
6. Electronics Compartment Fan
7. Display
8. HDMI
9. RS 232
10. Ethernet
11. Power Supply Input
12. IMB Connector

*Figure 3-6: Main Control Board (MCB) Connections*

3.2.3.2 Expansion Board

The Expansion Board (see Figure 3-7) is located behind the MCB in the electronics compartment.

![Expansion Board Connections](image)

1. Ribbon Cable
2. Micro USB
3. EtherNet

*Figure 3-7: Expansion Board Connections*
3.2.3.3 Electronics Compartment Fan

The electronics compartment fan (see Figure 3-8) is located on the top wall of the electronics compartment.

Figure 3-8: Electronics Compartment Fan Assembly

3.2.3.4 Power Supply Unit

The mains Power Supply Unit (PSU) is located on the right hand side wall of the electronics cabinet. This PSU is the main source of power to the printer and switched power supply, adjusting automatically for the acceptable range.

The PSU features are as follows:

• The input power to the PSU (ranges from 80 to 270 VAC, 50 – 60 Hz) automatically adjusts as required.

• The PSU provides 24 VDC voltage to the MCB.

Figure 3-9: Power Supply Unit
3.2.4 EHT Module

The EHT module (see Figure 3-10) is located on the left hand side wall of the electronics compartment.

![Figure 3-10: EHT Module](image)

3.2.5 Main Power Switch

The main power switch is located on the right hand side of the printer.

![Figure 3-11: Main Power Switch](image)
Main Parts

3.2.6 Ink Compartment

The ink compartment is as shown in Figure 3-12. The major parts in the ink compartment are:

- Fluid Cartridges
- Air Filter
- Service Module 2
- Service Module 1
- Ink System
- Positive Air Pump

![Figure 3-12: Ink Compartment]
3.2.6.1 Fluid Cartridges

The fluid cartridges are located inside the ink compartment.

![Figure 3-13: Fluid Cartridges](image)

1. Fluid Cartridge

3.2.6.2 Air Filter

The air filter (see Figure 3-14) is mounted on the door of the ink compartment.

![Figure 3-14: Air Filter](image)
Main Parts

3.2.6.3 Service Module 2

The Service Module 2 (see Figure 3-15) is located below the fluid cartridges.

![Service Module 2](image)

Figure 3-15: Service Module 2

3.2.6.4 Service Module 1

The Service Module 1 (see Figure 3-15) is located on the ink system.

![Service Module 1](image)

Figure 3-16: Service Module 1 Assembly
3.2.6.5 Positive Air Pump

The positive air pump (see Figure 3-17) is located in the ink compartment behind the ink cartridges. The positive air pump supplies pressurised air to the printhead for printing operation.

Note: When a customer orders an air dryer kit, the positive air pump is fitted to the printer and the air dryer kit must be installed as per provided instructions. The air dryer supplies positive air to the printhead from an external air source. Air dryers are required when the printer is operated in an environment with elevated humidity or where certain water sensitive inks are used. Please contact Videojet Technologies Inc. Customer Service Department at 1-800-843-3610 (United States only), or contact the local Videojet Technologies Inc. representative for more information.
Main Parts

3.2.6.6  Ink System

Ink system has various sub-systems as shown in the Figure 3-18. The major parts of the ink system are:

- Make-up Tank
- Mixer Tank
- Ink Pump
- VMS Chamber With Temperature Sensor
- Ink Management Board (IMB)
- Dual Valve Rocker Assembly
- Pre Venturi Filter
- Pre Venturi Filter
- Ink System Cover with Fan Assembly

* Item not shown in figure

Figure 3-18: Ink System
1. Make-up Tank

The make-up tank has a maximum capacity of 0.5 L (0.13 gal) and a nominal working capacity of 0.25 L (0.07 gal). The make-up tank has a continuous level detection system allowing measurement of fluid level to within +/- 1 mm (0.04 inches).

The make-up tank performs a clean stop and provides appropriate warning upon completion of the fluid.

2. Mixer Tank

The mixer tank has a maximum capacity of 2 L (0.53 gal) and a nominal working capacity of 1.0 - 1.3 L (0.26 gal - 0.34 gal). The mixer tank has a continuous level detection system allowing measurement of fluid level to within +/- 1 mm (0.04 inches).

The mixer tank contains drain ports to facilitate quick removal of ink from the tank. The inner portion of the mixer tank is tapered to avoid settling of ink particulars at the bottom of the tank.

3. Ink Pump

The ink pump is a positive displacement pump driven by a 24 VDC motor as shown in Figure 3-19.

The pump provides stable ink pressure to the nozzle during printing and also provides a flow of ink to other components inside the ink system.
4. VMS Chamber With Temperature Sensor

The VMS chamber with temperature sensor is as shown in the Figure 3-20. The VMS chamber with temperature sensor connects to the valves of the printhead. The VMS chamber with temperature sensor is used to measure the ink viscosity in the mixer tank.

![Figure 3-20: VMS chamber with temperature sensor](image)

5. Ink Management Board (IMB)

The IMB is as shown in the Figure 3-21. The IMB communicates with main control board through serial communication links. This provides local control for print operations.

![Figure 3-21: Ink Management Board (IMB) Connections](image)
6. Dual Valve Rocker Assembly

Dual rocker valves are non return valves connected to the VMS chamber with temperature sensor and ink system top plate as shown in the Figure 3-22.

![Figure 3-22: Dual Valve Rocker Assembly](image)

7. Pre Venturi Filter

The pre venturi filter as shown in the Figure 3-23 is connected to the ink pump.

![Figure 3-23: Pre Venturi Filter](image)
Main Parts

8. Ink System Cover with Fan Assembly

The fan assembly as shown in the Figure 3-24 is located in the ink system cover. A cooling fan circulates the air inside the ink compartment.

**Note:** If ink system cover is not secure or the required air filters are not changed, there may be a degradation of performance due to insufficient air flow causing heat build up in the ink compartment.

![Figure 3-24: Ink System Cover with Fan Assembly](image.png)
3.2.7 Standard IO

The Standard IO provides inputs for several types of external devices as shown in Figure 3-25. The various connections made from the Standard IO is provided in Figure 3-25.

![Standard IO Diagram]

3.2.7.1 Ethernet Connector

The Ethernet connector is used to connect the printer to a remote computer or network to import data or control the printer remotely.

![Ethernet Connector Diagram]

*Note: Figure 3-26 represents the view of the connector from the back of the printer.*
3.2.7.2 Product Detector (Print Trigger) 1 Connector

The product detector connector, detects the product and informs the printer, when to print on the product. The printer provides a +15 VDC, 200 mA output for use by a photoelectric cell (PEC), inductive proximity detector. The print trigger connector is a 3 way DIN connector. The pin functions are shown in Table 3-10.

**Note:** Photoelectric cell (PEC) is also called as inductive proximity detector or product detector.

The default configuration is NPN (current sinking input). This input can be changed to PNP (sourcing input) with the movement of a jumper located on the back of the touch screen display. If the input is configured for PNP the maximum input voltage will be +24 VDC and the maximum current is 60 mA.

![Print Trigger 1 Connector Pin Diagram](image)

**Note:** Figure 3-39 represents the view of the connector from the back of the printer.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>+15 VDC supply to sensor</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>Sensor output</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>0 VDC common</td>
</tr>
</tbody>
</table>

**Table 3-1: Print Trigger 1 Connector Pinouts**

**Note:** The mating cable (male, 3 pin DIN connector -P/N: 500-0036-578) is used to interface other product detectors to the printer.
3.2.7.3 Shaft Encoder Connector

The printer provides a nominal +15 VDC, 200 mA output for use by a shaft encoder with a maximum frequency of 100 kHz. The printer looks for NPN open collector input for the encoder signals. The printer uses pulses (leading and trailing edges) from both channels (Channel A and Channel B) of the shaft encoder. For more information, refer Line Speed. The shaft encoder connector is a 4 way DIN connector. The pin allocation is shown in Table 3-2 on page 3-19.

![Figure 3-28: Shaft Encoder Connector Pin](image)

Note: Figure 3-28 represents the view of the connector from the back of the printer.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>+15 VDC supply to shaft encoder</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>Shaft encoder input ‘A’</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>Shaft encoder input ‘B’</td>
</tr>
<tr>
<td>DIN Pin 4</td>
<td>0 VDC common</td>
</tr>
</tbody>
</table>

Table 3-2: Shaft Encoder Connector Pinouts

Note: The shaft encoder output must be of the PUSH/PULL type.

Note: The mating cable (male, 4 pin DIN connector - P/N: 500-0036-581) is used to interface other shaft encoders to the printer.
Main Parts

3.2.7.4 Status Output Connector

The printer provides an output for a set of status lights through the status output connector. This provides +24 VDC output, the printer will switch in a ground to turn on the light. This is a 6-way DIN connector. The pin allocation is shown in Table 3-3 on page 3-20 and Figure 3-29.

<table>
<thead>
<tr>
<th>Lamp color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Print Ready Output</td>
</tr>
<tr>
<td>Yellow</td>
<td>Warning Output</td>
</tr>
<tr>
<td>Red</td>
<td>Fault Output</td>
</tr>
</tbody>
</table>

Note: For 24 VDC, the maximum current rating is 900 mA.

![Figure 3-29: Status Output Connector Pin Diagram](image)

Note: Figure 3-29 represents the view of the connector from the back of the printer.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>Red lamp negative supply</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>Amber lamp negative supply</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>Green lamp negative supply</td>
</tr>
<tr>
<td>DIN Pin 4</td>
<td>+24 VDC supply to the strobe/siren</td>
</tr>
<tr>
<td>DIN Pin 5</td>
<td>Strobe/siren negative supply</td>
</tr>
<tr>
<td>DIN Pin 6</td>
<td>+24 VDC common to the traffic lights</td>
</tr>
</tbody>
</table>

Table 3-3: Status Output Connector Pinouts

Note: The mating cable (male, 6 pin DIN connector - P/N: 500-0036-577).
3.2.7.5 Relay Switches

The relay switches connector (see Figure 3-25) is a 7 way DIN connector. This connector supports the following relays:

- Relay ‘A’, you can use the relay to provide a ‘Print Ready’ output.
- Relay ‘B’, you can use the relay to provide a ‘Warning’ output.

Maximum Contact Loading

0.5 A @ +24 VDC

These relays have electrical ratings of 1 - 30 VDC, 300 mA maximum. It is suggested to use +24 VDC. For example, if the printer is in a print ready state, the normally open (N.O.) contacts closes and informs the host that the printer is in a print ready state. If the printer is removed from the print mode for any reason (removed from print), printer faults out, thus opens the contacts. The pin allocation is shown in Table 3-4.

![Figure 3-30: Relay Switches Connector Pin Diagram](image)

**Table 3-4: Relay Switches Connector Pinouts**

<table>
<thead>
<tr>
<th>Connector Pin</th>
<th>Function</th>
<th>Wire Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Pin</td>
<td>Male Pin</td>
<td></td>
</tr>
<tr>
<td>DIN Pin 1</td>
<td>DIN Pin 6</td>
<td>Relay A - Normally open contact</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>DIN Pin 5</td>
<td>Relay A - Normally closed contact</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>DIN Pin 4</td>
<td>Relay A - Common contact</td>
</tr>
<tr>
<td>DIN Pin 4</td>
<td>DIN Pin 4</td>
<td>Relay B - Normally open contact</td>
</tr>
<tr>
<td>DIN Pin 5</td>
<td>DIN Pin 2</td>
<td>Relay B - Normally closed contact</td>
</tr>
<tr>
<td>DIN Pin 6</td>
<td>DIN Pin 1</td>
<td>Relay B - Common contact</td>
</tr>
<tr>
<td>DIN Pin 7</td>
<td>DIN Pin 7</td>
<td>Not used</td>
</tr>
</tbody>
</table>

**Note:** Female connector (see Figure 3-30) represents the view of the connector from the back of the printer.

**Note:** The mating cable - P/N SP378810 (male, 7 pin DIN connector - P/N: 500-0036-583).

**Note:** These outputs are cold contact relays. It will not supply control voltage to the host system. If the host is going to send a control voltage through these contacts, it is suggested to use +24 VDC.
3.2.8 Expanded IO

Additional connectivity is available through the addition of Expansion Board and RS232 connector as shown in Figure 3-31 to the printer, for external devices.

There are two options available for expanded IO:

- RS232 connects to the MCB.
- Expansion board connects the additional IO.

The various connections made from the Expanded IO is provided in Figure 3-31.

*Output signal from photocell/shaft encoder as configured within the UI.

Figure 3-31: Expansion IO
3.2.8.1 Digital I/O

The I/O 25 way connector (Bulgin Connector) is as shown in Figure 3-31.

![Figure 3-32: I/O 25 way Connector](image)

*Note: Figure 3-31 represents the view of the connector from the back of the printer.*

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+15 VDC Supply Voltage</td>
</tr>
<tr>
<td>2</td>
<td>N/A</td>
</tr>
<tr>
<td>3</td>
<td>N/A</td>
</tr>
<tr>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td>N/A</td>
</tr>
<tr>
<td>6</td>
<td>Jet Stop (+)</td>
</tr>
<tr>
<td>7</td>
<td>Jet Stop (-)</td>
</tr>
<tr>
<td>8</td>
<td>Spare Input #1 (+)</td>
</tr>
<tr>
<td>9</td>
<td>Spare Input #1 (-)</td>
</tr>
<tr>
<td>10</td>
<td>Spare Input #2 (+)</td>
</tr>
<tr>
<td>11</td>
<td>Spare Input #2 (-)</td>
</tr>
<tr>
<td>12</td>
<td>Common</td>
</tr>
<tr>
<td>13</td>
<td>Power +12 VDC to +24 VDC (Customer Supply Voltage)</td>
</tr>
<tr>
<td>14</td>
<td>Print Complete (Open Collector)</td>
</tr>
<tr>
<td>15</td>
<td>Spare Output #1 (Open Collector)</td>
</tr>
<tr>
<td>16</td>
<td>Spare Output #2 (Open Collector)</td>
</tr>
<tr>
<td>17</td>
<td>Print Ready (Open Collector)</td>
</tr>
<tr>
<td>18</td>
<td>Warnings (Open Collector)</td>
</tr>
<tr>
<td>19</td>
<td>Faults (Open Collector)</td>
</tr>
<tr>
<td>20</td>
<td>Common</td>
</tr>
<tr>
<td>21</td>
<td>No Connection</td>
</tr>
</tbody>
</table>

*Table 3-5: I/O 25 Way Pinouts*
Main Parts

Jumper Settings

Jumpers for the Digital I/O are located on the upper right corner of Expansion PCB (Figure 3-33).

Table 3-5: I/O 25 Way Pinouts (continued)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>No Connection</td>
</tr>
<tr>
<td>23</td>
<td>No Connection</td>
</tr>
<tr>
<td>24</td>
<td>Chassis Ground</td>
</tr>
<tr>
<td>25</td>
<td>Chassis Ground</td>
</tr>
</tbody>
</table>

Notes:

- Inputs can be configured for NPN or PNP configuration.
- Inputs can be configured for opto isolated fully customer supplied
- Outputs are only NPN currently sinking.
- The “HD” on the expansion PCB represents the input number of the pin.
Note: Make sure to setup the inputs and outputs before assigning the ports within a message. Navigate to Tools > Printer Settings > Digital I/O to set the input and output parameters (Figure 3-33).

**Main Parts**

- **Input Circuit:**

  ![Input Circuit Diagram]

  Figure 3-35: Input Circuit

- **Output Circuit:**

  All outputs print ready, warnings, fault, print complete are current sinking outputs (NPN) only. It is recommend to use a 1K or 2.2K pull-up resistor to the +15VDC to see the transition of the output. It is also recommended that this output drive a solid state relay if the customer would like a sourcing output.

  Note: If the customer has a +24VDC I/O, a recommended solid state relay to use is Videojet P/N: 377526.
3.2.8.2 Ethernet Connector

The Ethernet connector is used to connect the printer to a remote computer or network to import data or control the printer remotely.

Figure 3-26 on page 3-17 represents the view of the connector from the back of the printer.

3.2.8.3 Message A and B Input Connector

There are eight external message inputs provided on expansion board with four inputs on message connector.

The printer uses the message inputs to select messages numbers coded in Binary Coded Decimal (BCD) format (00-99) with Message A as the least significant digit.

![Message A Input Connector](image)

Figure 3-36 represents the view of the connector from the back of the printer.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>0 (Least significant bit +15 VDC supply)</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>0 (Least significant bit input)</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>1 (Second bit +15 VDC supply)</td>
</tr>
<tr>
<td>DIN Pin 4</td>
<td>1 (Second bit input)</td>
</tr>
<tr>
<td>DIN Pin 5</td>
<td>2 (Third bit +15 VDC supply)</td>
</tr>
<tr>
<td>DIN Pin 6</td>
<td>2 (Third bit input)</td>
</tr>
<tr>
<td>DIN Pin 7</td>
<td>3 (Most significant bit +15 VDC supply)</td>
</tr>
<tr>
<td>DIN Pin 8</td>
<td>3 (Most significant bit input)</td>
</tr>
</tbody>
</table>

Table 3-6: Message A Input Connector Pinouts
Figure 3-37 represents the view of the connector from the back of the printer.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>4 (Least significant bit +15 VDC supply)</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>4 (Least significant bit input)</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>5 (Second bit +15 VDC supply)</td>
</tr>
<tr>
<td>DIN Pin 4</td>
<td>5 (Second bit input)</td>
</tr>
<tr>
<td>DIN Pin 5</td>
<td>6 (Third bit +15 VDC supply)</td>
</tr>
<tr>
<td>DIN Pin 6</td>
<td>6 (Third bit input)</td>
</tr>
<tr>
<td>DIN Pin 7</td>
<td>7 (Most significant bit +15 VDC supply)</td>
</tr>
<tr>
<td>DIN Pin 8</td>
<td>7 (Most significant bit input)</td>
</tr>
</tbody>
</table>

*Table 3-7: Message B Input Connector Pinouts*

<table>
<thead>
<tr>
<th>Input</th>
<th>Message Selection Bits</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 6 5 4 3 2 1 0</td>
<td>0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>0 0 0 0 0 0 0 0</td>
<td>9 0 0 0 0 1 0 0 1</td>
</tr>
<tr>
<td>0 1 0 1 0 1 0 0</td>
<td>54 0 1 0 1 0 1 0 0</td>
</tr>
<tr>
<td>1 0 0 1 1 0 0 1</td>
<td>99 1 0 0 1 1 0 0 1</td>
</tr>
</tbody>
</table>

*Table 3-8: Message Selection Bits - An Example*
3.2.8.4 RS-485 Connector

The RS-485 connector (item 910) is a 5 way DIN (180 degree or stereo type) connector. Use this to connect the printer to an RS-485 network to import data or control the printer remotely at up to 1 Mbps (bi-directional, half-duplex). The pin allocation is shown in Table 3-9.

![Figure 3-38: RS-485 Connector](image)

*Note:* Figure 3-38 represents the view of the connector from the back of the printer.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>Line A</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>Line B</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>0 VDC common</td>
</tr>
<tr>
<td>DIN Pin 4</td>
<td>-</td>
</tr>
<tr>
<td>DIN Pin 5</td>
<td>-</td>
</tr>
</tbody>
</table>

*Table 3-9: RS-485 Connector Pinouts*
3.2.8.5 Product Detector (Print Trigger) 2 Connector

The product detector connector, detects the product and informs the printer, when to print on the product. This is used for the bi-directional (reverse print) input, used for traversing printhead applications. This input reverses the characters and message when it is triggered before Print Trigger 1 is triggered. The printer provides a +15 VDC, 200 mA output for use by a photoelectric cell (PEC), inductive proximity detector. The print trigger connector is a 3 way DIN connector. The pin functions are shown in Table 3-10.

*Note:* Photoelectric cell (PEC) is also called as inductive proximity detector or product detector.

The default configuration is NPN (current sinking input). This input can be changed to PNP (sourcing input) with the movement of a jumper located on the back of the touch screen display. If the input is configured for PNP the maximum input voltage will be +24 VDC and the maximum current is 60 mA.

![Print Trigger 2 Connector Pin Diagram](image)

*Note:* Figure 3-39 represents the view of the connector from the back of the printer.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>+15 VDC supply to sensor</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>Sensor output</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>0 VDC common</td>
</tr>
</tbody>
</table>

*Table 3-10: Print Trigger 2 Connector Pinouts*

*Note:* The mating cable (male, 3 pin DIN connector -P/N: 500-0036-578) is used to interface other product detectors to the printer.
3.2.8.6 Loop Out

The Loop Out functionality allows 2 or more printers to be linked together. The Loop Out cable allows up to two print trigger outputs and one shaft encoder output from one printer to be input to a second printer. The inputs to the printer can be used as required. The pin allocation is shown in Table 3-11.

![Diagram of Loop Out Connector]

**Figure 3-40: Loop Out Connector**

*Note: Figure 3-40 represents the view of the connector from the back of the printer.*

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>0 VDC common</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>Sensor output (Print Trigger 1)</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>Sensor output (Print Trigger 2)</td>
</tr>
<tr>
<td>DIN Pin 4</td>
<td>Shaft encoder input ‘A’</td>
</tr>
<tr>
<td>DIN Pin 5</td>
<td>Shaft encoder input ‘B’</td>
</tr>
<tr>
<td>DIN Pin 6</td>
<td>+15VDC supply</td>
</tr>
</tbody>
</table>

*Table 3-11: Loop Out Connector Pinouts*
3.2.8.7 RS-232 Connector

The printer has an RS-232 communication port at up to 250 kbps, 1-8-1, no parity, bi-directional, full-duplex. The RS-232 connector is a 5 way DIN connector. The pin allocation is shown in Table 3-12.

![Figure 3-41: RS-232 Connector](image)

*Note: Figure 3-41 represents the view of the connector from the back of the printer.*

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Pin 1</td>
<td>0 VDC common</td>
</tr>
<tr>
<td>DIN Pin 2</td>
<td>Transmit data out from the printer</td>
</tr>
<tr>
<td>DIN Pin 3</td>
<td>Receive data into the printer.</td>
</tr>
<tr>
<td>DIN Pin 4</td>
<td>RTS output from the printer.</td>
</tr>
<tr>
<td>DIN Pin 5</td>
<td>CTS input to the printer.</td>
</tr>
</tbody>
</table>

*Table 3-12: RS-232 Connector Pinouts*

3.2.9 Umbilical

The umbilical contains electrical wiring and ink system tubing from the printer to the printhead. The standard length of the umbilical is 3 m (9.84 ft).
3.2.10 Printhead

The printhead is as shown in Figure 3-42. The printhead consists of the following parts:

- Printhead Cover
- Valve Module
- Print Module
- Printhead PCB

3.2.10.1 Printhead Cover

The printhead cover is attached to the printhead with a screw.
3.2.10.2 Valve Module

The valve module contains 4 valves to perform the function of:

- Ink Feed
- Solvent Flush
- Nozzle Purge
- Gutter

![Valve Module Diagram](image)

1. Ink/Solvent Feed Valve  2. Bleed/Gutter Valve

*Figure 3-43: Valve Module*
Main Parts

3.2.10.3 Print Module

The print module is as shown in Figure 3-44 on page 3-34. The print module can be easily detached from head control module. The print module consists of the following parts:

- Nozzle
- Charge Electrode
- Deflection Plate
- Phase Detectors (Electrodes)
- Gutter tube

The print module also consists of an optical sensor that detects build up on the gutter tube.

Figure 3-44: Print Module

1. Nozzle
2. Vertical Adjustment Screw
3. Vertical Locking Screw
4. Deflection Plate
5. Gutter Tube
6. Phase Detectors (electrodes)
7. Horizontal Adjustment Screw
8. Horizontal Locking Screw
9. Nozzle Holder
Main Parts

1. Nozzle:
The nozzle creates the ink droplets.

2. Charge Electrode:
The charge electrode applies an electrical charge to each ink droplet. The charge applied to the droplet is variable and affects the position of the droplet on the substrate.

3. Deflection Plate:
The deflection plate is supplied with a fixed positive DC voltage (typically 7000-8000VDC) from the EHT Module. This voltage deflects the charged drops over the top of the gutter, through the printhead slot, and onto the substrate.

4. Phase Detectors:
The phase detectors measure the ink drop velocity and perform phasing.

5. Gutter Tube:
The gutter tube is the return path for the uncharged ink droplets that are not used for printing. The gutter delivers the ink back into the ink mixer tank.

   The gutter detects when ink is present in the gutter.

3.2.10.4 Printhead PCB

The printhead PCB is as shown in "Print Module" on page 3-34. The printhead PCB connects to the MCB.

Figure 3-45: Printhead PCB
3.2.10.5 Printhead Functions

The phasing and velocity fly-by sensors and supporting circuitry contribute directly or indirectly to the performance of six critical control functions during steady-state operation:

- Phasing
- Modulation control
- TOF measurement
- Pump speed control
- Target pressure control
- Viscosity control

The functions of the ink system are provided in Table 3-13.

<table>
<thead>
<tr>
<th>Name</th>
<th>Function</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phasing</td>
<td>Between prints, charge transfer to test drops is measured by the LEAD fly-by sensor (phase detector) in order to synchronize drop charging to drop break-off, thereby optimizing print quality.</td>
<td>Performed approximately 25 times per second</td>
</tr>
<tr>
<td>Modulation Control</td>
<td>Between prints, modulation amplitude is validated by performing an abbreviated auto-modulation test using the LEAD fly-by sensor (phase detector). The amplitude is changed in small increments whilst measuring the rate of change of the phase angle in order to verify that the amplitude setting remains at or near the “appropriate setting”.</td>
<td>Performed continuously</td>
</tr>
<tr>
<td>TOF Measurement</td>
<td>Between prints, drop velocity is monitored by measuring the TIME OF FLIGHT of the test drops from the LEAD (phase) sensor to the TRAILING (velocity) sensor. The measured result is referred to as the “actual velocity”.</td>
<td>Performed every TENTH phasing test</td>
</tr>
<tr>
<td>Pump Speed Control</td>
<td>A pressure transducer inside of the ink system measures “actual pressure”. This pressure is compared to the “target pressure”. The resultant error is used to increase or decrease the pump speed.</td>
<td>Performed once per second</td>
</tr>
<tr>
<td>Target Pressure Control</td>
<td>The “target pressure” represents the nominal pressure the printer determines that it must operate at in order for the actual velocity to be equal to the “velocity set point”. The printer makes modifications to the target pressure by reviewing the “history” of the velocity error parameter (“PID” control). “Velocity error” refers to the difference between the actual velocity and the set point.</td>
<td>Occur every 10 seconds</td>
</tr>
</tbody>
</table>

*Table 3-13: Ink System Functions*
3.2.10.6 Printhead Operation

The printhead operation principle is as shown in Figure 3-46. The flush supply and ink supply lines merge at valve V1. The ink is heated as it flows through the manifold assembly to the nozzle. The nozzle is outfitted with both the feed and the bleed ports. The nozzle bleed port provides a source of vacuum, used during manual irrigation/backflushing.

<table>
<thead>
<tr>
<th>Name</th>
<th>Function</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity Control</td>
<td>Once the printer has determined its “target pressure”, it has the means to perform viscosity adjustments. Determination concerning viscosity is made by comparing the empirically-determined “target pressure” to a reference pressure known as the “temperature-compensated target pressure”. This value is acquired indirectly from data encoded on the ink cartridge Smart Chip. This reference pressure is mathematically determined and represents the pressure required to acquire the correct “actual velocity” under ideal viscosity conditions. If the target pressure deviates from the reference pressure, the printer attributes this to viscosity variation and responds accordingly.</td>
<td>Pressure is constantly measured. The printer adds make-up if the pressure goes outside the given range for a set time period.</td>
</tr>
</tbody>
</table>

Table 3-13: Ink System Functions (continued)

3.2.10.6 Printhead Operation

The printhead operation principle is as shown in Figure 3-46. The flush supply and ink supply lines merge at valve V1. The ink is heated as it flows through the manifold assembly to the nozzle. The nozzle is outfitted with both the feed and the bleed ports. The nozzle bleed port provides a source of vacuum, used during manual irrigation/backflushing.

Figure 3-46: Printhead Operation

1. Gutter Tube
2. EHT Plate
3. Charge Electrode
4. Nozzle
5. Heater

Ink Supply
Make-up Supply
Under Vacuum
Main Parts

The flow of ink is as follows:

1. The ink and solvent mixture flows through the feed line into the printhead.
2. The ink enters the feed valve.
3. The valves open or close as per the print requirements.
   
   Note: The bleed valve opens and closes as needed during flushing the nozzle and supplying ink to the nozzle.

4. The ink flows into the nozzle.

   Note: To adjust the nozzle, refer to "Nozzle Adjustment" on page 4-22.

5. The piezoelectric crystal vibrate the nozzle at a frequency of around 77 KHz nominal value in the longitudinal direction. This vibration enables the nozzle to breakup the stream of ink into droplets.

6. The ink drops enter the charge electrode where they are charged at different voltage levels based on the character to be generated.

7. The charged ink drops then pass through the EHT Field and over the phase detectors.

8. The EHT plate deflects the charged drops of ink at various angles depending on the charge placed on the drop at the moment of breakoff.

9. An electrically conductive ink is supplied under pressure by the ink system to the nozzle assembly through the ink feed pipe.

10. An ink stream is formed as the ink is forced out of the nozzle jet orifice (see Figure 3-47). A modulation signal is applied to a ceramic transducer which is clamped to the nozzle assembly. The transducer crystals cause the nozzle assembly to vibrate longitudinally, breaking up the ink stream into droplets, a small distance away (the break up point) from the nozzle jet orifice.

The ink droplets are produced at the same rate as the modulation frequency. The ink droplets are uniform in size and separated by equal distances. The nozzle orifice diameter is 60 microns.

![Figure 3-47: Ink Jet Formation](image)

- 1. Ink Feed Pipe
- 2. Damping Mass
- 3. Crystal Transducer
- 4. Crystal Transducer
- 5. Nozzle Jet Orifice
- 6. Nozzle Assembly
Droplet Charging

11. The charge electrode is positioned at the break up point of the ink stream and extends for several drops either side of it.

   Note: This allows a tolerance for break up position and shields the ink stream from the influence of the other electrostatic fields.

The ink stream and the charge electrode can be considered as the two electrodes of a capacitor. By raising the charge electrode to a specific positive voltage (with a charge pulse) the section of the ink system within the charge electrode will have a negative charge induced on it. When a drop of ink then breaks from the jet it will have trapped on it a charge directly proportional to that on the charge electrode.

If the positive voltage is then removed from the charge electrode, the negative charge on the jet will discharge through the ink jet and nozzle assembly to ground. However, the drop of ink which has become detached from the jet cannot discharge as it no longer has a conductive path to ground.

![Figure 3-48: Charge Electrode](image)

1. Nozzle Assembly
2. Charge Electrode

Droplet Charging

12. The droplet stream passes through an electrostatic field maintained by the deflector electrodes that are connected to a high tension supply.

13. The negatively charged droplets are deflected by the field towards the high voltage deflector electrode.

The distance a drop is deflected is proportional to the charge carried. The charge carried is proportional to the voltage applied to the charge electrode when the drop became detached from the ink jet.
Main Parts

The charged droplets once deflected leave the printhead to form characters in a dot matrix format on the substrate. Droplets which are not required for printing are not charged and are therefore not deflected.

Figure 3-49: Droplet Deflection
Section 4  Installation

Introduction

This section describes the procedures to install and commission the printer.

⚠️ CAUTION
EQUIPMENT DAMAGE. Only Videojet-trained personnel must carry out the installation and maintenance work. Any such work undertaken by unauthorized personnel can damage the printer and invalidate the warranty.

⚠️ WARNING
PERSONAL INJURY. Make sure that the mains electrical supply is within the range indicated by the label adjacent to the mains inlet of the printer. If the voltage ratings differ, do not use the printer until you consult your Videojet supplier. Use only the mains power cable supplied with the printer. This cable must terminate in an approved, three-pole, mains plug which has a protective ground conductor. Keep electrical power cables, sockets and plugs clean and dry at all times.

⚠️ WARNING
PERSONAL INJURY. The printer must be connected to an AC power supply, which has a protective ground conductor in accordance with IEC requirements or applicable local regulations. Any interruption of the protective ground conductor or disconnection to the protective ground terminal may render the apparatus dangerous.

⚠️ WARNING
PERSONAL INJURY. Lethal voltages are present within this equipment when it is connected to the mains electrical supply. Observe all statutory electrical safety codes and practices. Unless it is necessary to run the printer, disconnect the printer from the mains electrical supply before removing the covers, or attempting any service or repair activity. The failure to follow this warning can cause death or personal injury.
4.1 Tools and Supplies

Tools

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>239534</td>
<td>Torx Screwdriver T6</td>
</tr>
<tr>
<td>239540</td>
<td>Hex Screwdriver 1.27mm</td>
</tr>
<tr>
<td>239543</td>
<td>Hex Screwdriver 3mm</td>
</tr>
<tr>
<td>5260001112</td>
<td>Tubing Cutters</td>
</tr>
<tr>
<td>5260001115</td>
<td>Tubing Pliers</td>
</tr>
<tr>
<td>234710</td>
<td>Tool Bag</td>
</tr>
<tr>
<td>234632</td>
<td>USB Stick</td>
</tr>
</tbody>
</table>

*Table 4-1: Service Tool Kit*

Supplies

<table>
<thead>
<tr>
<th>Supplies Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ink Cartridge</td>
<td>2</td>
</tr>
<tr>
<td>Make-up fluid cartridge</td>
<td>2</td>
</tr>
<tr>
<td>Wash bottle</td>
<td>1</td>
</tr>
<tr>
<td>Wash solution</td>
<td>1</td>
</tr>
<tr>
<td>Gloves</td>
<td></td>
</tr>
<tr>
<td>Tissue</td>
<td></td>
</tr>
</tbody>
</table>

*Table 4-2: Supplies*
4.2 Typical Production Line

A typical printer installation is shown in Figure 4-1, where the printer (item 6) is mounted on a printer stand (item 7). The printhead (item 1) is configured to print vertically with the help of a clamp and bracket assembly. A stack light (item 8) is fitted to the printer.

Figure 4-1: Typical Production Line Installation

1. Printhead
2. Shaft Encoder
3. Shaft Encoder Cable
4. Print Trigger
5. Print Trigger Cable
6. Printer
7. Printer Stand
8. Stack light
9. Printhead Stand
Installation

4.3 Unpack and Inspect the Printer

1. Open the shipping box, and make sure that all the parts listed in the packing list are present in the box. If any part is missing, contact Videojet Technologies Inc.

2. Make sure that there are no damaged parts. If any part is damaged, contact Videojet Technologies Inc. to order a new part.

4.4 Commission the Printer

This section describes the tasks that a user must perform to commission the printer.

4.4.1 Inspect the Ink System

1. Put the printer on a stand or table.

   Note: The printer can be mounted on two types of stands: mobile printer stand or the wall-mounting assembly. Refer to the respective installation instructions to install the printer on a stand.

   △ CAUTION

   EQUIPMENT DAMAGE.

   The printer should be placed directly on a flat or solid surface, or bolted to a Videojet supplied stand. In either case the printer must not be operated when tilted. Always keep the printer upright on flat surface.

2. Rotate the vertical position knob in the counter-clockwise direction and unlock the door. Open the ink compartment door (see Figure 4-2).
3. Press the latch at the side of the ink compartment to open the door completely (see Figure 4-3).

4. Remove and discard the internal packaging materials.

5. Pull the ink system out of the ink compartment (see Figure 4-4).
6. Inspect the ink system for any disconnected tubes or cables. Make sure all the tubes are connected to the ink system manifold. Refer to Table 4-3 for the connection.

![Figure 4-5: Ink System Manifold Connections](image)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Connections</th>
<th>Tube</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ink Return</td>
<td>Clear Large</td>
<td>Ink flows into the mixer tank from printhead.</td>
</tr>
<tr>
<td>2</td>
<td>Ink Addition</td>
<td>Black Stripe</td>
<td>Ink flows into the mixer tank from cartridge.</td>
</tr>
<tr>
<td>3</td>
<td>Ink Feed</td>
<td>Red</td>
<td>Fluid flows from mixer tank to printhead.</td>
</tr>
<tr>
<td>4</td>
<td>Not Used</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Make-up Feed/Return</td>
<td>Green Stripe</td>
<td>Make-up fluids flows between make-up tank and make-up cartridge</td>
</tr>
<tr>
<td>6</td>
<td>Gutter recirculation</td>
<td>Clear</td>
<td>Flows to umbilical</td>
</tr>
<tr>
<td>7</td>
<td>Vent to cabinet</td>
<td>Blue Stripe</td>
<td>Breather tube to cabinet</td>
</tr>
</tbody>
</table>

*Table 4-3: Ink System Connections*

7. Verify that tubing and the flush filter are clear of ink.

![Figure 4-6: Flush Filter](image)
8. Make sure all the cables are connected to the ink system (see Figure 4-7).

![Figure 4-7: Ink System Cable Connections](image)

- 1. Positive Air Pump Harness
- 2. Ribbon Cable
- 3. IMB to MCB Cable

9. Make sure all tubes and the ribbon cable is connected to the back of the cartridge holder (see Figure 4-8).

![Figure 4-8: Cartridge Holder Connections](image)

10. Push the ink system into the ink compartment.
Installation

11. Make sure the positive air pump is properly mounted in the ink compartment and the tubes are connected and plugged in properly.

12. Make sure the gasket on the ink compartment door is fitted correctly. Check the alignment of the gasket while opening and closing the door. Make sure the gasket is compressed evenly between the door and the cabinet while closing the door.

4.4.2 Inspect the Electronics System

13. Remove the two display sealing plugs (item 3, Figure 5) at the bottom of the touch screen display assembly to access the screws that secure the touch screen display to the cabinet. Remove these two screws (item 2).
14. Raise the touch screen display to access the electronics compartment. Make sure that all the
electrical cables are fitted and routed correctly.

![Electronics Compartment](image)

15. Record the MCB revision number printed on the MCB.

16. Lower the touch screen display and secure it to the cabinet using the two screws. Insert the
two display sealing plugs in its position on the touch screen display.

17. Close the ink compartment door.

4.4.3 Log into UI

18. Connect the printer to the AC power supply and turn on the printer. Do the following task to
turn on the printer:

a. Make sure that the mains power supply cable is connected.

b. Press the main power switch on the side of the printer.

c. The printer will start up and upon completion the Home screen is displayed. The status
   bar of the printer displays SHUTDOWN.
19. The Home screen appears on the display as shown in Figure 4-2.

20. Log into the printer.

21. Open the ink compartment door to confirm the ink fan is running.
22. Navigate to Tools > Printer Settings > System Information and record the following:

   • Application
   • Common Library
   • Qt Build
   • Qt Runtime
   • OS Version
   • Release ID
   • Build System
   • Boot Loader
   • FPGA (MCB)
   • µC (IMB)
   • µC (Printhead PCB)
   • IMB
   • Service Module 1
   • Service Module 2
   • Printhead Board
   • Print Module

23. Navigate to Tools > Diagnostics > Ink System > Ink and confirm that Mixer Tank (ml) is zero.

24. Navigate to Tools > Diagnostics > Ink System > Make-up and confirm that Make-up Tank (ml) is zero.

25. Navigate to Tools > Diagnostics > Temperature and Humidity > Ink and confirm that Ink Temp (°C) is equal to Ambient Temp (°C).
4.4.4 Inspect the Printhead

26. Remove the printhead cover (see Figure 4-3) and inspect for any loose fittings or tubing. Verify that the printhead is clean and dry.

27. Navigate to Tools > Ink Build-up Sensor and confirm that the gutter profile has been correctly established. Refer to Table 4-4 for information on gutter profiles.

<table>
<thead>
<tr>
<th>Profile</th>
<th>Status</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Correct Profile]</td>
<td>Correct</td>
<td>No Action</td>
</tr>
<tr>
<td>![Incorrect Profile]</td>
<td>Incorrect</td>
<td>Check sensor for damage.</td>
</tr>
</tbody>
</table>

Table 4-4: Gutter Profile
28. If gutter movement is suspected, then confirm that the gutter is locked in place with the following steps:

a. Remove the gutter access plate.

![Gutter Access Plate](image)

Figure 4-4: Gutter Access Plate

b. Verify that the gutter locking screw is secure.

![Gutter Locking Screw](image)

Figure 4-5: Gutter Locking Screw

c. Navigate to Tools > Gutter Optical Sensor > Configure and select “Reset to Zero”.

29. Replace the printhead cover and position the printhead over the service tray.

30. Fit the Ink cartridge and the Make-up cartridge into the slots. Navigate to Tools > Diagnostics > Ink System > Ink and press Update button to program the Service Module 1 and IMB with the required ink type.

<table>
<thead>
<tr>
<th>Profile</th>
<th>Status</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorrect</td>
<td>Perform Step 28</td>
<td></td>
</tr>
</tbody>
</table>

Table 4-4: Gutter Profile
4.4.5 Installation User Interface

Start the operation and follow each step as required until complete.

31. Touch the button from the Tools screen. The Installation screen opens up in the Phase 1 (Figure 4-6). Set the required information as shown in Table 4-5.

![Figure 4-6: Installation phase 1](image)

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>• Language - Touch the drop down list to select the language.</td>
</tr>
<tr>
<td></td>
<td>Once complete, touch the Next button to continue.</td>
</tr>
</tbody>
</table>

![Table 4-5: Installation Phase 1](image)
Installation

Location

- Country - Touch the drop down list to select the country.
- Unit of Measure - Touch either Metric or Imperial to set measurement unit.
- Keypad Configuration - Touch the Keypad Configuration to select the default keypad from available keypads (Languages).

Touch the Next button to save the changes and continue.

Date and Time

- Calendar - Touch the drop down list to select the Gregorian or Hijra type of calendar.
- Current Date - Displays the current date.
- Current Time - Displays the current time.

Touch the Done button to save the changes and continue.

Table 4-5: Installation Phase 1
32. The installation procedure will move to phase 2 on the completion of phase 1.

![Phase 2 of 3 installation process](image)

*Figure 4-7: Installation-Phase 2*

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Test</td>
<td>Touch the Next button to initiate the valve test. All the valves are tested for their functionality and check box selected against each valve when test is completed. Touch the Next button to continue.</td>
</tr>
<tr>
<td></td>
<td><em>Note: Touch the Repeat button if the test needs to be re-run.</em></td>
</tr>
</tbody>
</table>

*Table 4-6: Installation Phase 2*
**Installation**

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
</table>
| **Load Ink**    | Remove the make-up cartridge from left hand slot and install the ink cartridge.  
                     **Note:** Load Make-up will be automatically initiated upon completion of Load Ink. |
| **Load Make-up**| Remove the ink cartridge from left hand slot and install the make-up cartridge. |
| **Prime Fluid Lines** | The Prime Fluid Lines operation is ready to start, please ensure the bowl is under the printhead and touch Next to continue. |

*Table 4-6: Installation Phase 2*
## Installation

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Printhead</td>
<td>Clean the printhead following the video instructions and touch the Next button to continue.</td>
</tr>
<tr>
<td>Jetting Check</td>
<td>Jet is started to confirm correct jet operation, a sheet of paper is required to be placed under the printhead. Touch the Next button when in place.</td>
</tr>
<tr>
<td>Jetting Check</td>
<td>Select the image on the UI that most closely reflects the image on the sheet of paper.</td>
</tr>
</tbody>
</table>

Table 4-6: Installation Phase 2
Jetting Check

If the selected image is not acceptable, a Nozzle Backflush needs to be performed. Follow the instructions to perform Nozzle Backflush. After the Nozzle Backflush is complete, the check will be repeated. Once the jetting check is successful, the operation will continue.

Print Quality Test

Touch the Print button to start the test print. Follow the instructions to complete the test print. Review the prints for errors. Once complete, touch the Done button to continue to phase 3 installation.

Table 4-6: Installation Phase 2
33. After completing the installation phase 2, user interface proceeds to phase 3 as shown in Figure 4-8. Set the required information as shown in Table 4-7.

Figure 4-8: Installation-Phase 3

Table 4-7: Installation Phase 3

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printer Information</td>
<td>Confirm the Printer Information shown is correct. The Printer Serial Number is displayed along with the default Printer Name. To enter a unique printer name, touch the textbox to enter the required name and touch Accept button to save. Touch the Next button to continue.</td>
</tr>
</tbody>
</table>
Enter the required service contact information by selecting the text box. Name and Phone are mandatory fields. Touch the **Next** button to continue.

Enter the required customer contact information by selecting the text box. Name and Phone are mandatory fields. Touch the **Next** button to continue.

Displays the administrator role name and password. Touch the **Done** button to complete the installation.

The User Access tool opens up on completion of the installation procedure. For more information on creating a new user/role, refer to "Configuring User Access Mode" on page 4-37.

**Table 4-7: Installation Phase 3**
4.4.6 Nozzle Adjustment

34. Check the position of the ink stream in the gutter. The ink stream should be horizontally centered, and 3 stream widths below the top rim of the gutter (vertically).

35. If the jet alignment is incorrect, then stop the jet and perform a nozzle backflush (Refer to "Maintenance User Interface" on page 8-2).

36. If jet alignment remains incorrect following flushing, then perform an ink stream alignment. Do the following tasks to perform the ink stream alignment:

   a. Wait 10 minutes to allow the ink jet to stabilize.

   b. Use an eye loupe to check that the stream is centered in the Charge Tunnel.

   c. Check the drop break-off. A good break-off is within the Charge Tunnel with teardrop-shaped drops with tails pointing toward the nozzle, few if any satellites.

   d. If break-off is marginal, then Navigate Tools > Printer Settings > Printhead Control and confirm that Automatic Modulation is enabled.
37. Navigate to Tools > Diagnostics > Diagnostics Data and record the following:
   Printhead and Nozzle
   • Phase Profile
   • Jet velocity
   • Nozzle Voltage
   • Head Temperature
   Ink System
   • Ink Viscosity
   • Ink Temperature

![Diagnostics Data Screen](image)

Figure 4-10: Diagnostics Data Screen

38. Verify that all error conditions have now been cleared. Check the errors screen to ensure that all error conditions are accounted for.
39. Install the printhead cover. Use the positive air flow meter and cap and verify that the positive air flow rates out of the printhead slot is between 7 and 12 scfh. Record the measured positive air flow rate.

40. Take a print sample by performing the following steps:

a. Create a 5x7 twin-line message.

b. Create a new line setup for continuous printing (Navigate to Tools > Line Setup) with the following parameters:

<table>
<thead>
<tr>
<th>Print Mode</th>
<th>Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print Interval</td>
<td>Time</td>
</tr>
<tr>
<td>Interval Value (ms)</td>
<td>100</td>
</tr>
<tr>
<td>Product Detector Triggered</td>
<td>NO</td>
</tr>
<tr>
<td>Line Speed</td>
<td>Manual Setup</td>
</tr>
</tbody>
</table>

*Table 4-8: Continuous Line Setup*

c. Load the message and start the test print.

The commission procedure of the printer is complete.
4.5 Create a Line Setup

Refer to Chapter "User Interface", Operator Manual for more information.

1. Touch the button from the Tools screen. The Line Setup screen opens.

2. Set the Product Direction, Printhead Orientation and Print Mode as required by the production line.

3. Navigate to Print Trigger option. Set the Printhead throw distance (mm) from 5 mm to 15 mm. The optimum throw distance is 12 mm.

   Note: When the throw distance is increased, the print delay may also need to be increased in order to account for the additional time for ink to reach product.

4.5.1 Line Speed

There are three options available for the line speed:

- Manual Setup - This is used when the line speed is constant.
- Measured by Shaft Encoder - This is used when the product is transported on a conveyor or transport. The shaft encoder must move directly in relation to the movement of the conveyor to work properly.
- Measured by Product Size/Time - This is used when there is no way of tracking the production line movement. This option uses a very accurate detector to sense the leading and trail edge of each product and adjust the width of the code for every product.
4.5.1.1 Manual Setup (Internal Encoding)

An internal clock sets the stroke rate to a constant pace.

Do the following tasks to set Line Speed to Manual Setup:

1. Select the Manual Setup option and touch the Next button. Enter the line speed in m/min and touch the Done button as shown in Figure 4-12.

2. Ensure the following information is set for Print Trigger option:
   - Minimum PD Width (µs)
   - Media Width Filter (mm)

   Note: Media width filtering sets the product length in the printer and allows the printer to ignore the product detect signal whilst the product is in front of the printer. To enable media width filtering, navigate to Tools > Line Setup > Print Trigger > Media Width Filter.
4.5.1.2 Measured by Shaft Encoder (External Encoding)

If the conveyor speed varies, an external shaft encoder must be fitted in order to maintain constant message width. If the product moves, the encoder turns and if the product stops, the encoder stops.

*Note:* Make sure that the movement of the product is directly related to the movement of the conveyor.

Do the following tasks to setup an external shaft encoder:

1. Turn off the printer.
2. Connect the shaft encoder cable to the shaft encoder connector. Figure 4-13 shows the shaft encoder connector on the Standard IO.

   *Note:* The user can configure the printer to accept a two-phased encoder input (quadrature).

3. Turn on the printer and navigate to Tools > Line Setup > Line Speed.

![Figure 4-13: Standard IO](image)

![Figure 4-14: Measured by Shaft Encoder](image)
4. Select the Measured by Shaft Encoder option and touch the Next button. The shaft encoder setup screen is displayed shown in Figure 4-15.

![Figure 4-15: Encoder Signal Type](image)

5. Enter the Encoder (PPR) and Wheel Circumference (mm) as shown in Figure 4-15.

6. Select the Encoder Type and touch the OK button. Refer Figure 4-16 and Table 4-9 on page 4-29.

![Figure 4-16: Encoder Type](image)
7. Select the Direction and touch the OK button. Refer Figure 4-17 and Table 4-10.

<table>
<thead>
<tr>
<th>Encoder Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Quadrature Mode</td>
<td>Single direction</td>
</tr>
<tr>
<td></td>
<td>No directional monitoring of product</td>
</tr>
<tr>
<td></td>
<td>Can use single or dual channel encoder</td>
</tr>
<tr>
<td>Quadrature Mode</td>
<td>Select Direction of print</td>
</tr>
<tr>
<td></td>
<td>Monitors direction of product</td>
</tr>
<tr>
<td></td>
<td>Must use dual channel encoder</td>
</tr>
</tbody>
</table>

Table 4-9: Encoder Type

8. Make sure the encoder movement is in direct relation to the movement of the product being printed on.

9. Touch the ON button to enable the rollback compensation option as shown in Figure 4-15 on page 4-28.

10. Touch the Done button.

Refer to "Measured by Shaft Encoder (External Encoding)" on page B-2 for example on setting up shaft encoder.
4.5.1.3 Measured by Product Size/Time (Auto Encoding)

When Measured by Product Size/Time is selected, the signal from the product detector is used to determine the product speed, and code the product at a set stroke rate.

Do the following tasks to set Line Speed to Measured by Product Size/Time:

1. Navigate to Tools > Line Setup > Line Speed > Measured by Product Size/Time.

2. Enter the Product Width and the Auto Encoder timeout.

3. Touch the Done button.

**Note:** Measured by Product Size/Time is not viewable if the Print Mode (Tools > Line Setup > Print Mode) is selected as Continuous or Media Width Filtering (Tools > Line Setup > Print Trigger) is enabled.
4.6 Install the Print Trigger

Connect the print trigger (item 4, Figure 4-1 on page 4-3) to the standard IO. Print trigger connector pin details are shown in Figure 3-27 on page 3-18.

**Note:** Print Trigger 2 is for reverse print and is not a product detector trigger, but a change in state reverses the direction of print. It has an NPN and PNP connection. The Print Trigger 2 option is available with the optional Expansion IO board.

Do the following tasks to install a print trigger:

1. The print triggers may be either NPN or PNP devices. The default signal input is NPN. Set Jumper JB1 on the MCB or Expansion Board to match the device type.

2. Turn on the printer.

3. Navigate to Tools > Line Setup > Print Trigger and set the required PD Trigger Edge (see Figure 4-11 on page 4-25).

**Note:** The minimum distance between product detector and printhead must be 44.4 mm (1.75 inches).
4.7 User Access

The User Access provides options to create, edit and delete different levels of access to the printer. The functions for each user can be configured as per customers requirements through user interface.

*Note:* When Access Mode is selected as Role, the user is not allowed to access the Configure Users tab.

![User Access Home Screen](image)

*Figure 4-21: User Access Home Screen*

Types of access mode provided to the user:

- Role
- User
4.7.1 Configuring Role access mode

Role access mode is provided to different levels of user modes on the roles performed by the user for operating the printer. The user can enable automatic logout option and set the time limit for automatic logout as shown in Figure 4-21 on page 4-32.

1. Touch the **Configure Roles** option to create a new role based access.

2. Touch the **New** button to create a new role, the Settings screen for configure roles opens as shown in the Figure 4-22.

3. Touch the Name text box to enter the name for the new role. The Enter Name screen opens.

4. Enter the required name using utility keypad and touch the **Accept** button.

5. Select the required option for the selected role as shown in Figure 4-22.

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>Touch the <strong>Communications</strong> button on the Function List screen to enable access to user and touch the OK button to save.</td>
</tr>
<tr>
<td>Configure Home Screen</td>
<td>Touch the <strong>Configure Home Screen</strong> button on the Function List screen to enable access to Configure Home screen information and touch the OK button to save.</td>
</tr>
</tbody>
</table>

*Table 4-11: Configure Roles*
<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumables</td>
<td>Touch the Consumables button on the Function List screen to enable access to consumable details and touch the OK button to save.</td>
</tr>
<tr>
<td>Custom Reference Builder</td>
<td>Touch the Custom Reference Builder button on the Function List screen to enable access to user and touch the OK button to save.</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Touch the Diagnostics button on the Function List screen to enable access to view the diagnostic data and touch the OK button to save.</td>
</tr>
<tr>
<td>EtherNet/IP*</td>
<td>Touch the EtherNet/IP button on the Function List screen to enable access to user and touch the OK button to save.</td>
</tr>
<tr>
<td></td>
<td>Note: Ethernet/IP is an optional setting available as a workflow module.</td>
</tr>
<tr>
<td>Faults and Warnings</td>
<td>Touch the Faults and Warnings button on the Function List screen to enable access to clear the alarms and touch the OK button to save.</td>
</tr>
<tr>
<td>File Manager</td>
<td>Touch the File Manager button on the Function List screen to enable access to file manager option and touch the OK button to save.</td>
</tr>
<tr>
<td>Firmware</td>
<td>Touch the Firmware button on the Function List screen to enable access to firmware option and touch the OK button to save.</td>
</tr>
<tr>
<td>Global Job Settings</td>
<td>Touch the Global Job Settings button on the Function List screen to enable access to user and touch the OK button to save.</td>
</tr>
<tr>
<td>High Speed Imaging*</td>
<td>Touch the High Speed Imaging button on the Function List screen to enable access to High Speed Imaging and touch the OK button to save.</td>
</tr>
<tr>
<td>Home</td>
<td>Touch the required options on the Function List screen to enable access for the user.</td>
</tr>
<tr>
<td></td>
<td>• Print</td>
</tr>
<tr>
<td></td>
<td>• Start Technology</td>
</tr>
<tr>
<td></td>
<td>• Jobs</td>
</tr>
<tr>
<td></td>
<td>• Print 1x</td>
</tr>
<tr>
<td></td>
<td>• Adjust</td>
</tr>
<tr>
<td></td>
<td>Select the required option and touch the OK button to save.</td>
</tr>
</tbody>
</table>

Table 4-11: Configure Roles (continued)
### Ink Build-up Sensor

Touch the *Ink Build-up Sensor* button on the Function List screen to enable access to Ink Build-up Sensor and touch the *OK* button to save.

### Installation

Touch the *Installation* button on the Function List screen to enable access for the user and touch the *OK* button to save.

### Installation Procedure

Touch the *Installation procedure* button on the Function List screen to enable access for the user and touch the *OK* button to save.

### Jobs

Touch the required options on the Function List screen to enable access for the user.
- New Job
- Delete
- Rename
- Edit Job
- Run Job

Select the required option and touch the *OK* button to save.

### Line Setup

Touch the *Line Setup* button on the Function List screen to enable access for the user and touch the *OK* button to save.

### Maintenance

Touch the required options on the Function List screen to enable access for the user.
- Maintenance
- Empty & Clean System

Select the required option and touch the *OK* button to save.

---

*Table 4-11: Configure Roles (continued)*
### Installation

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Touch the required options on the Function List screen to enable access for the user.</td>
</tr>
<tr>
<td></td>
<td>- Performance</td>
</tr>
<tr>
<td></td>
<td>- Production Statistics</td>
</tr>
<tr>
<td></td>
<td>Select the required option and touch the OK button to save.</td>
</tr>
<tr>
<td>Performance</td>
<td><em>Refers to Optional Workflow Modules</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preview</td>
<td>Touch the required options on the Function List screen to enable access for the user.</td>
</tr>
<tr>
<td></td>
<td>- Edit</td>
</tr>
<tr>
<td></td>
<td>- Position</td>
</tr>
<tr>
<td></td>
<td>Select the required option and touch the OK button to save.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printer Settings</td>
<td>Touch the Printer Settings button on the Function List screen to enable access for the user and touch the OK button to save.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Download</td>
<td>Touch the Software Download button on the Function List screen to enable access for the user and touch the OK button to save.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Access</td>
<td>Touch the User Access button on the Function List screen to enable access control and touch OK button to save.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Videojet Connect Remote Service</td>
<td>Touch the Videojet Remote Service button on the Function List screen to enable access for the user and touch OK button to save.</td>
</tr>
</tbody>
</table>

*Note: Ethernet/IP is an optional setting available as a workflow module.*

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table 4-11: Configure Roles</strong></td>
<td><em>Refers to Optional Workflow Modules</em></td>
</tr>
</tbody>
</table>

6. Touch the **Continue** button to save the settings made.
To Enable the User to Access through Role Based

7. Touch the **Role** button on the User Access Home screen as shown in the Figure 4-21 on page 4-32.

8. Touch the check box to activate Automatic logout option, touch the logout time text box to enter the time interval for automatic logout.

9. Enter the required time interval in mins using utility keypad and touch the button.

10. Touch the **Save** button as shown in Figure 4-22 on page 4-33 to save the settings and activate the role based access to the printer.

4.7.2 Configuring User Access Mode

User access mode provides options to the user to create, clear, edit and delete the user access by selecting the role.

1. Touch the **Configure Users** button to create a new user access mode.

2. Touch the **New** button to create a new role, the Settings screen for configure roles opens as shown in the Figure 4-23.

3. Touch the Name text box to enter the name for the new user. The Enter Name screen opens.

4. Enter the required name using utility keypad and touch the **Accept** button.

![Figure 4-23: User Access Mode Settings](image-url)
5. Touch the Password text box to enter the password for the new role. The Enter Password screen opens.

6. Enter the required name using utility keypad and touch the Accept button.
7. Touch the True button to activate the user name.
8. Select the required role for the user can be enabled to access.
9. Touch the Continue button to save the new user name for user based access.

**To Enable the User to Access through User Mode**

10. Touch the button on the User Access Home screen as shown in the Figure 4-21 on page 4-32.

11. Touch the check box to activate Automatic logout option, touch the logout time text box to enter the time interval for automatic logout.

12. Enter the required time interval in mins using utility keypad and touch the Accept button.

13. Touch the Save button as shown in Figure 4-23 on page 4-37 to save the settings and activate user access mode to the printer.

Table 4-11 on page 4-33 displays the options available for role based user access.
Introduction

This chapter provides the service level operations that can be performed on the printer and contains information on the Diagnostics screen.

5.1 Diagnostics

The Diagnostics screen displays the current values of various parameters that helps in troubleshooting the printer.

1. Touch the button from the Tools screen. The Diagnostics screen opens as shown in the Figure 5-1.

![Figure 5-1: Diagnostics](image)
5.1.1 System State Parameters

The system state parameters provide the current status of the major components of the printer such as printhead, ink system, temperature and humidity, valves, electronics and IO.

1. Touch the button from the Tools screen. The Diagnostics screen opens as shown in the Figure 5-2.

![Figure 5-2: System State Screen](image)

The system state parameters displays the information for following components as shown in Table 5-1.

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printhead</td>
<td>Touch the following options to view the values for various parameters:</td>
</tr>
<tr>
<td></td>
<td>• Nozzle</td>
</tr>
<tr>
<td></td>
<td>• Phasing/Velocity</td>
</tr>
<tr>
<td></td>
<td>• EHT</td>
</tr>
<tr>
<td></td>
<td>• Gutter</td>
</tr>
<tr>
<td></td>
<td>• Accelerometer</td>
</tr>
</tbody>
</table>

*Table 5-1: System State Parameters*
### Printer Operation

#### Ink System

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ink System</td>
<td>Touch the following options to view the values for ink system parameters:</td>
</tr>
<tr>
<td></td>
<td>• Ink Pump</td>
</tr>
<tr>
<td></td>
<td>• Make-up Pump</td>
</tr>
<tr>
<td></td>
<td>• Viscosity</td>
</tr>
<tr>
<td></td>
<td>• Ink</td>
</tr>
<tr>
<td></td>
<td>• Make-up</td>
</tr>
</tbody>
</table>

#### Temperature and Humidity

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature and Humidity</td>
<td>Displays the temperature and humidity values for various parameters like Printhead, Ink, MCB etc,</td>
</tr>
</tbody>
</table>

#### Valves

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valves</td>
<td>Displays the status (opened or closed) of all the valves.</td>
</tr>
</tbody>
</table>

**Table 5-1: System State Parameters (continued)**
### Sub Menu

**Electronics**

Touch the following options to view the values for various parameters:
- MCB Voltages
- IMB Voltages
- Printhead PCB Voltages

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
</table>
| **Electronics** | Touch the following options to view the values for various parameters:  
- MCB Voltages  
- IMB Voltages  
- Printhead PCB Voltages |

<table>
<thead>
<tr>
<th>Sub Menu</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I/O</strong></td>
<td>Displays the status of input/output connected devices.</td>
</tr>
</tbody>
</table>

*Table 5-1: System State Parameters (continued)*
5.1.2 Diagnostics Data

The Diagnostic Data screen provides current information on printer parameters like pressure, temperature, velocity, phase, valve states etc.

1. Touch the button from the Tools screen. The Diagnostics screen opens. Select the option Diagnostics Data as shown in Figure 5-3.

![Figure 5-3: Diagnostics Data Screen](image)

The Diagnostics Data screen displays the key information for printhead, nozzle and ink system for quick and easy diagnostics.
Printer Operation

5.1.3 Self Test

The Self Test screen provides diagnostic information on hardware components installed in the printer.

1. Touch the button from the Tools screen. The Diagnostics screen opens. Select the option Self Test as shown in Figure 5-4.

2. Touch the button to start the test.

Note: Do not leave the Self Test screen otherwise the results will be lost.

3. A test log is generated on completion of the tests. Use the scroll bar to view the results of the tests.

Note: Failed test results are displayed in red. Tests that did not run are displayed in black.

4. Touch the button to save the tests to the USB.

5. A confirmation message is displayed and touch the button.

Note: The Self Test assumes fluids are present, running the Self Test without fluids will report additional failed tests.
5.1.4 Sequences

The Sequences screen provides the list of available operations for the printer.

1. Touch the button from the Tools screen. The Diagnostics screen opens. Select the option Sequences as shown in Figure 5-5.

2. Touch the required operation from the sequences list. This will open the System Operation screen.

3. Touch the button to start the operation.

*Note: The screen displays OK upon completion.*

Table 5-2 shows the various system operations available on the Sequences screen:

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime Mixer Tank</td>
<td>Performs prime mixing operation to increase the viscosity of ink flow for a quality print.</td>
</tr>
<tr>
<td>Prime Make-up Tank</td>
<td>Performs make-up priming operation to obtain proper mixture.</td>
</tr>
<tr>
<td>Umbilical Purge</td>
<td>Performs umbilical purge operation to prevent debris from blocking the nozzle if the printer has not been used for a longtime.</td>
</tr>
<tr>
<td>Quick Umbilical Purge</td>
<td>Performs umbilical purge operation and finishes automatically after a short period of time.</td>
</tr>
</tbody>
</table>

*Table 5-2: Sequences*
## 5.1.5 Data Logging

The Data Logging screen allows the Data Log USB, when available, to collect data at a specific time intervals. This provides the service team with additional information to support troubleshooting and diagnostics.

*Note:* The Data Log USB contains a specific xml file to support the collection of the printer data. A log is recorded every 2 sec.

1. Touch the ![button](image) button from the Tools screen. The Diagnostics screen opens.
   
   Select the option *Data Logging* as shown in **Figure 5-6**.

   ![Diagnostics Screen](image)

   **Figure 5-6: Data Logging Screen**

2. Touch the ON/OFF button to enable/disable the data log option.

   *Note:* If enabled, touch the Interval text box to set the required time interval for log data information.

   Contact Videojet Technical Support or your local Service Representative for the Data Logging USB.
5.1.6 **Scratchpad**

The Scratchpad screen allows the user to load customized sequences for specific tasks.

1. Touch the button from the Tools screen. The Diagnostics screen opens. Select the option *Scratchpad* as shown in Figure 5-7.

![Diagnostics Screen](image)

*Figure 5-7: Scratchpad Screen*

Sequences need to be located in a specific folder location on the USB.

**Note:** Sequences can be built by Videojet Technical support - contact Videojet Technical Support for additional information. It is important that the sequences are correctly built to ensure continued safe operation of the printer.
Section 6  User Interface

Introduction

This chapter provides the service level operations that can be performed on the printer and contains the following topics:

- Home Screen Description
- Using the Tools Screen

6.1 Home Screen Description

Figure 6-1 shows the Home screen of the Videojet 1860 printer.
6.1.1 Control Bar

These buttons are available on all menu screens.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Start Jet" /></td>
<td>Starts or stops the jet.</td>
</tr>
</tbody>
</table>
| ![Stop Jet](image) | Starts or stops the print.  
*Note: This button is displayed on the status bar only when the jets are started.* |
| ![Home](image) | Returns to the Home screen. |
| ![Jobs](image) | Shows the list of jobs available, including the current job and the preview of the highlighted job. Once a job is selected, the job can be loaded for printing. If the fields are user enabled, the user can confirm before printing. The user can also create a new job. |
| ![Tools](image) | Opens the Tools screen. |
| ![Login](image) ![Logout](image) | Login or Logout the user from an access level. |
| ![Adjust](image) | Adjusts the print position and scale of the print. |

*Table 6-1: Control Bar Buttons*
6.1.2 Printer Status

The status bar of the printer displays current status of the printer on the top of the screen. The different status of the printer is described in the Table 6-2.

<table>
<thead>
<tr>
<th>Status Bar</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHUTDOWN</strong></td>
<td>Power to the printhead is disabled and printer is not ready to print.</td>
</tr>
<tr>
<td><strong>RUNNING</strong></td>
<td>Printer is switched on and ready to print when the proper print trigger is received.</td>
</tr>
<tr>
<td><strong>OFFLINE</strong></td>
<td>Printer is switched on but not ready to print.</td>
</tr>
<tr>
<td><strong>OFFLINE</strong></td>
<td>Warnings are available that the operator should be aware of, before the printer is not prevented from operating.</td>
</tr>
<tr>
<td><strong>Fault</strong></td>
<td>Faults are available that the printer should rectify, before the printer can start.</td>
</tr>
</tbody>
</table>

Table 6-2: Printer Status
### User Interface

#### 6.1.3 Home Screen

The Home screen displays the print details.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Home Screen Preview" /></td>
<td>Shows the preview of the job loaded.</td>
</tr>
<tr>
<td><img src="image" alt="Batch Product Count" /></td>
<td>User can customize this section as per their requirement (<em>Tools &gt; Configure Home Screen</em>). Touch in this area to view further details. Shows the batch product count, batch print count, printer availability and pieces/minute.</td>
</tr>
<tr>
<td><img src="image" alt="Fluid Levels" /></td>
<td>Shows the fluid levels (in %) and the calculated run time remaining. Touch in this area to open the consumable menu.</td>
</tr>
</tbody>
</table>

Table 6-3: Home Screen Display Functions

Refer to Operator Manual for more information on Home screen.
6.2 Using the Tools Screen

Displays the tools available for the printer.

Refer to Operator Manual for more information on Tools.

Figure 6-2: Tools Screen
User Interface

6.2.1 Printer Settings

The Printer Settings screen allows user to view and modify printer parameters.

Do the following tasks to view the Printer Settings screen:

1. Touch the button from the Tools screen. The Printer Settings screen is displayed as shown in Figure 6-3.

![Figure 6-3: Maintenance Screen](image)
6.2.1.1 Printhead Control

Printhead Control parameters are setup during printer installation and should not normally be adjusted (see Figure 6-4).

![Figure 6-4: Printhead Control](Image)

Following are the parameters available for Printhead Control:

<table>
<thead>
<tr>
<th>Controls</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Gutter Fault</td>
<td>The printer will raise a fault when a gutter fault is detected.</td>
</tr>
<tr>
<td>Automatic Modulation</td>
<td>Automatic Modulation can be enabled or disabled.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> <em>Not recommended to disable.</em></td>
</tr>
<tr>
<td>Manual Mod. Voltage (V)</td>
<td>Displays the manual mod. voltage value.</td>
</tr>
<tr>
<td>Manual Mod. Frequency</td>
<td>Displays the manual mod. frequency value.</td>
</tr>
<tr>
<td>Last Known Good Mod. (V)</td>
<td>Displays the voltage of last “known good configuration”.</td>
</tr>
<tr>
<td>Tracking</td>
<td>User can enable/disable the tracking only when Automatic Modulation option is enabled.</td>
</tr>
<tr>
<td>Print Height Adjust. (V)</td>
<td>Changes the maximum achievable print height.</td>
</tr>
<tr>
<td>Charge Scale</td>
<td>Select the required value.</td>
</tr>
<tr>
<td>Phase Charge (V)</td>
<td>Set the voltage to optimize the print quality.</td>
</tr>
</tbody>
</table>

*Table 4-4: Printhead Control*
User Interface

6.2.1.2 Digital I/O

Digital I/O parameter sets the various input or output devices (see Figure 6-4).

Following are the parameters available for Digital I/O:

<table>
<thead>
<tr>
<th>Controls</th>
<th>Description</th>
</tr>
</thead>
</table>
| Input    | Touch the individual input button to select required input.  
  • Signal - Select None, Increment Counter, Reset Counter, Stop Jet, Enable Print and Disable Print for individual inputs.  
  • Active Polarity - Touch the High or Low button to enable the required polarity.  
  Touch OK button to save the changes. |
| Output   | Touch the individual output button to select required output.  
  • Signal - Select None, Print Enabled, No Code No Run, Print Complete, Fault Active and Warning Active for individual outputs.  
  • Active Polarity - Touch the High or Low button to enable the required polarity.  
  Touch OK button to save the changes. |

Table 4-5: Digital I/O

Refer to Chapter "User Interface", Operator Manual for more information.
6.2.2 Software Download

The Software Download screen allows the user to upgrade system software, install and uninstall workflow modules.

1. Touch the button from the Tools screen. The Software Download screen opens as shown in the Figure 6-6.

![Software Download Screen](image)

*Figure 6-6: Software Download Screen*
2. Touch the Printer Information to display the Software information related to the printer. The software version can be exported to a USB file or via Network to allow the unique printer file to be uploaded to the Workflow Portal.

![Software Download - Printer Information](image1)

*Figure 6-7: Software Download - Printer Information*

3. Touch the Install Workflow Module and select the drive to install if the Workflow Module is available.

![Software Download - Install](image2)

*Figure 6-8: Software Download - Install*
4. Touch the Uninstall Workflow Module and select to uninstall if a Workflow Module is no longer required.

![Software Download-Uninstall](image)

*Figure 6-9: Software Download-Uninstall*

5. Touch the Upgrade System Software to upgrade the system software, select the drive where the upgrade is available, select the required software package and select Upgrade.

![Software Download-Upgrade](image)

*Figure 6-10: Software Download-Upgrade*
6. Touch the Downgrade System Software to downgrade the system software, select the drive where the downgrade is available, select the required software package and select Downgrade.

![Software Download - Downgrade](image1)

*Figure 6-11: Software Download-Downgrade*

7. Touch the Connect to Videojet Workflow Portal to allow the printer to connect directly to the Workflow Portal. This enables download of system software packages and Workflow Module(s) and upload of printer files. For more information contact Videojet customer service or your local distributor.

![Software Download](image2)

*Figure 6-12: Videojet Workflow Portal*
6.2.3 Communications

The Communications screen allows the user to display the connections of printer.

1. Touch the button from the Tools screen. The Communication screen opens as shown in the Figure 6-13.

Refer to Chapter “User Interface”, Operator Manual for more information on Language, Print Ack, Transmit Field and CijLan 1 setup.
User Interface

6.2.3.1 Communication Classifications

The following Table 4-6 shows the available Communications and its Connections:

<table>
<thead>
<tr>
<th>Communications</th>
<th>Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>CijLan 1</td>
<td>LAN 1</td>
</tr>
<tr>
<td>CijLan 2</td>
<td>LAN 2</td>
</tr>
<tr>
<td>COM5</td>
<td>RS232</td>
</tr>
<tr>
<td>COM6</td>
<td>RS485</td>
</tr>
<tr>
<td>COM7</td>
<td>RS232 (2) Not used</td>
</tr>
<tr>
<td>COM8</td>
<td>RS485 (2) Not used</td>
</tr>
</tbody>
</table>

Table 4-6: Communications

6.2.3.2 Extended IO Setup

For each of the connected extended IO, touch the required connector and set the required parameters (see Figure 6-14).

![Communications settings](image)

Figure 6-14: Expansion Board Enabled
Section 7  Replacement Instructions

Introduction

When you order a spare part kit, the replacement instructions of the respective spare part are provided along with the kit. For more information, contact Videojet Technologies Inc. Refer to Chapter, “Support and Training” for the contact information.

The replacement instructions are available for the parts included in the following table.

<table>
<thead>
<tr>
<th>Spare Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Dryer</td>
</tr>
<tr>
<td>Beacon</td>
</tr>
<tr>
<td>EHT Module</td>
</tr>
<tr>
<td>Expansion PCB</td>
</tr>
<tr>
<td>Ink Door Assembly</td>
</tr>
<tr>
<td>Ink Management Board</td>
</tr>
<tr>
<td>Ink Pump</td>
</tr>
<tr>
<td>Ink System</td>
</tr>
<tr>
<td>Ink System Components</td>
</tr>
<tr>
<td>Main Control Board</td>
</tr>
<tr>
<td>Positive Air Pump</td>
</tr>
<tr>
<td>Power Cable</td>
</tr>
<tr>
<td>Power Supply Unit</td>
</tr>
<tr>
<td>Power Switch</td>
</tr>
<tr>
<td>Print Module Assembly</td>
</tr>
<tr>
<td>Printer Mobile Stand Installation (IP55)</td>
</tr>
<tr>
<td>Printer Mobile Stand Installation (IP66)</td>
</tr>
<tr>
<td>Service Module 1</td>
</tr>
<tr>
<td>Service Module 2</td>
</tr>
<tr>
<td>Touch Screen Display</td>
</tr>
<tr>
<td>Umbilical Assembly</td>
</tr>
<tr>
<td>Valve Module Assembly</td>
</tr>
<tr>
<td>Wall Mounted Bracket Assembly</td>
</tr>
</tbody>
</table>

Table 7-7: Available Instructions
7.1 Printhead Bonding during Printing

Do the following tasks to establish bonding for the printhead and receptacle:

1. Make sure that the printhead cover (item 6, Figure 7-15) is attached.

   Note: The printhead is ground through the printhead screw (item 3) and umbilical (item 1). If there is no screw, you must provide the printhead with the path to the electrical ground.

2. Use a metal or other conducting receptacle (item 5) to collect the printhead fluid.

3. Connect one end of the earth bond strap (item 2) using crocodile clip (item 4) to the receptacle. Make sure that the connection is rigid.

4. Connect the other end of the earth bond strap to the printhead cover screw. Make sure that the connection is rigid.

5. Check the path from the electrical ground to the main printer cabinet using a multi-meter or a similar device to make sure that the earth loop is closed.

6. After the checks are completed, continue the printing operation.
7.2 Bonding during Servicing

1. Remove the printhead cover (see Figure 7-15 on page 7-2).

2. Locate the printhead screw into the printhead (Figure 7-16) and make sure that the screw is in contact with the earth wire in the umbilical.

3. Follow Step 2 to Step 5 under "Printhead Bonding during Printing" on page 2.

4. Perform the required maintenance operation. Refer to Section 8 "Maintenance" for more information on maintenance procedures.

5. Remove the printhead screw.

6. Refit the printhead cover.

The printhead bonding instructions is complete.
Introduction

The maintenance of the printer includes the intervals, tasks and procedures that a trained service technician or authorized personnel can perform.

This section provides the information on the following topics:
  - Maintenance Schedule
  - Maintenance User Interface

8.1 Maintenance Schedule

The Table 8-1 provides the list of maintenance activities that needs to be performed on a periodic schedule:

<table>
<thead>
<tr>
<th>Interval</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>As Required</td>
<td>Clean the Print Cabinet</td>
</tr>
<tr>
<td>As Required</td>
<td>Clean the Touch Screen</td>
</tr>
<tr>
<td>As Prompted</td>
<td>Replacement of Fluid Cartridges</td>
</tr>
<tr>
<td>As Prompted</td>
<td>Clean the Printhead</td>
</tr>
<tr>
<td>3,000 hrs</td>
<td>Replacement of Air Filter</td>
</tr>
<tr>
<td>5,000 hrs</td>
<td>Replacement of Service Module 1</td>
</tr>
<tr>
<td>12,000 hrs</td>
<td>Replacement of Service Module 2</td>
</tr>
</tbody>
</table>

Table 8-1: Maintenance Schedule

Refer to Operator manual for detailed procedure on maintenance schedules.
8.2 Maintenance User Interface

The Maintenance screen allows user to perform maintenance activities on the printer.

Do the following tasks to view the Maintenance screen:

1. Touch the button. The Maintenance screen is displayed as shown in Figure 8-1.

2. Select the required options to perform maintenance activities of the printer.

Refer to Operator manual for detailed procedure on maintenance instructions.
Section 9  Troubleshooting

Introduction

The Videojet 1860 Operator Manual (Part Number: 462651) contains the troubleshooting procedures that an operator is allowed to perform. Refer to the operator manual for these procedures.

This chapter contains the troubleshooting procedures that only trained personnel or a service technician is allowed to perform.

⚠️ WARNING
PERSONAL INJURY.
It is possible that in a fault condition the heater can reach 70°C. Do not touch the plate on which the heater is installed. The failure to follow this warning can cause personal injury.

Important Guidelines

1. Before you perform fault diagnosis or do any repairs described in this section, Videojet recommends to shift the printer from the production line to a clean environment.

2. When a fault condition occurs, the first step to locate the cause must be to check the fault number on the display.

3. Table 9-5 on page 9-5 lists the possible faults and warnings. These tables contain either remedial action or a reference to more detailed fault finding information.

4. When you need to replace a part (for example, MCB, Touch screen and so on), refer to the related replacement instructions. For more information on how to obtain the related instructions, refer to Chapter 7, “Replacement Instructions”.

### Troubleshooting

#### 9.1 Startup Problems

##### 9.1.1 Printer Fails to Start

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Remedial Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printer does not start</td>
<td>Check the power cord and plug for damage.</td>
</tr>
<tr>
<td>No mains power supply</td>
<td>Make sure that the mains power supply is available. To turn on the printer, press the on/off button.</td>
</tr>
</tbody>
</table>
| Mains Power supply input cable disconnected or defective | 1. Make sure that the mains power supply cable is connected.  
2. Check the continuity of the cable. If the cable is defective, repair or replace the cable. |
| Printer mains power circuit breaker has tripped | Reset the circuit breaker - Turn off and turn on the circuit breaker.         |
| Mains Power switch is faulty                  | Check mains if the switch is working. Replace the switch if faulty.            |
| Cable between mains switch and PSU is disconnected or faulty | 1. Check the cable connections. Reconnect if necessary.  
2. Check the cable for continuity. Replace if faulty. |
| PSU output not reaching the MCB              | Make sure the Power LED is ON and LED is flashing.                              |
| Cable between PSU and MCB is faulty or disconnected | 1. Check if the cable between PSU and MCB is connected. Reconnect if necessary.  
2. Check the cable for continuity, replace if faulty. |
| PSU faulty                                    | Replace the PSU.                                                                |
| MCB failed                                   | 1. Make sure that Print Module and Ethernet LED are flashing.  
2. Change the MCB.                            |

*Table 9-1: Printer Startup Problem and Remedies*
9.2 Display Faults

9.2.1 Backlight

⚠️ WARNING

PERSONAL INJURY.
Lethal voltages are present within this equipment when it is connected to the mains electrical supply. Only trained and authorized personnel must carry out the maintenance work.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Remedial Action</th>
</tr>
</thead>
</table>
| Cable between MCB and front panel is disconnected or faulty | 1. Check for correct fitting of cable.  
2. Check the cable for continuity, replace if faulty. |
| MCB faulty | Check for 24 VDC on pin 6 of connector on MCB. If 24 VDC is not present, replace the MCB. |

Table 9-2: Display Backlight Failure

9.2.2 LCD Faults

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Remedial Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD doesn't light</td>
<td>Check display is in sleep mode from the user interface. Check the cabling. Check the MCB.</td>
</tr>
<tr>
<td>Cables between MCB and LCD is faulty</td>
<td>Check the cable for continuity. Replace if faulty.</td>
</tr>
<tr>
<td>MCB faulty</td>
<td>Check for 24 V at MCB from PSU. Replace the PCB.</td>
</tr>
<tr>
<td>LCD faulty</td>
<td>Replace the LCD assembly.</td>
</tr>
</tbody>
</table>

Table 9-3: LCD Failure
## 9.3 Beacon Indication

<table>
<thead>
<tr>
<th>Beacon Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>• Alarm present&lt;br&gt;• Jet off&lt;br&gt;• All relays are off</td>
</tr>
<tr>
<td>Amber</td>
<td>• Jet on/off&lt;br&gt;• Warning present&lt;br&gt;• Print not enabled&lt;br&gt;• Relay 2 is set</td>
</tr>
<tr>
<td>Green</td>
<td>• Print enabled&lt;br&gt;• No warnings&lt;br&gt;• Relay 1 is set</td>
</tr>
<tr>
<td>Green and Amber</td>
<td>• Print enabled&lt;br&gt;• Warning present&lt;br&gt;• Relay 1 and 2 is set</td>
</tr>
<tr>
<td>Red and Amber</td>
<td>• Alarm present&lt;br&gt;• Warning present&lt;br&gt;• Jet off&lt;br&gt;• Relay 2 is set</td>
</tr>
<tr>
<td>No Lights</td>
<td>• Jet on or off&lt;br&gt;• No alarms&lt;br&gt;• No warnings&lt;br&gt;• Print disabled&lt;br&gt;• All relays are off</td>
</tr>
</tbody>
</table>

*Table 9-4: Alarm Light Conditions*
9.4 Fault Messages and Warnings

The errors are divided into two groups:

- Warning Errors - These errors indicate a warning condition. The printer continues to print until the warning condition becomes a fault condition.

  ![Figure 9-1: Warning Message](image)

- Fault/Alarm Errors - These errors indicate a fault condition. During a fault condition, the printer stops printing.

  ![Figure 9-2: Fault Message](image)

9.4.1 Printer Alarms

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15804</td>
<td>Air Filter Replacement Recommended</td>
<td>The Air Filter has reached the end of its recommended service life. Please replace the Air Filter.</td>
<td></td>
</tr>
<tr>
<td>E15591</td>
<td>Ambient Temperature Sensor Communication Error</td>
<td>The Ink Management PCB is unable to communicate with the Ambient Temperature Sensor. Please cycle power the printer. If the alarm persists, please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms
### Troubleshooting

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15464</td>
<td>Ambient Temperature Sensor is an Open Circuit</td>
<td></td>
<td>1) Defective Ink Management PCB (sensor or TMP chip). Note that the sensor itself is a transistor (Q39) surface-mounted to the board in the vicinity of U26 (front-left portion of the board near the pump connector). Therefore, there is no 'connection' to check.</td>
</tr>
<tr>
<td>E15463</td>
<td>Ambient Temperature Sensor Supply Voltage Too Low</td>
<td>The supply voltage to the Ambient Temperature Sensor circuit is below the minimum allowed value. Please contact your local Videojet Service Representative.</td>
<td>1) Defective Ink Management PCB. 2) Faulty component in the ink system is pulling down the local +3.3 VDC supply.</td>
</tr>
<tr>
<td>E15562</td>
<td>Electronics Compartment Temperature Too Hot</td>
<td>The measured temperature in the Electronics Compartment is above the allowed limit. Please check the ambient conditions in the vicinity of the Printer and relocate it if necessary.</td>
<td>1) Ambient environmental extreme. 2) Cabinet inadvertently or intentionally insulated. 3) Electronics Compartment fan not working. 4) Faulty component has caused compartment overheating. 5) Defective MCB.</td>
</tr>
<tr>
<td>E15801</td>
<td>Clean &amp; Empty System Operation In Progress</td>
<td>The Clean &amp; Empty System operation is in progress. The Jet cannot be started whilst this operation is running.</td>
<td></td>
</tr>
<tr>
<td>E15???</td>
<td>A Crash Dump File is Available</td>
<td>A Crash Dump File is available for download. Please download to USB disk and contact your local Videojet Service Representative.</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15199</td>
<td>Printer Log Error</td>
<td>An error has occurred whilst saving Printer Log information. Please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
<tr>
<td>E15254</td>
<td>Faulty Raster File Detected</td>
<td>The Printer has identified a faulty Raster File within its memory. Please contact your local Videojet Service Representative.</td>
<td>1) Anomaly during software upgrade procedure. 2) Rogue version containing excess or incorrectly named files was loaded.</td>
</tr>
<tr>
<td>E15042</td>
<td>File Does Not Exist</td>
<td>The requested File cannot be found. Please confirm filename is correct and file is avialable.</td>
<td></td>
</tr>
<tr>
<td>E15572</td>
<td>Service Module 1 Not Fitted or Invalid</td>
<td>A valid Service Module 1 cannot be detected by the printer. Please install a suitable Service Module 1.</td>
<td>1) Service Module 2 1 is removed. 2) Service Module 2 1 is not fitted correctly. 3) Service Module 2 1 Smart Chip is not programmed. 4) Bad connection between the Ink Management PCB and the Service Module 2 1 Smart Chip Reader. 5) One-wire bus failure. 6) Defective Ink Management PCB. 7) Defective Ink System Bare (Smart Chip Reader)</td>
</tr>
<tr>
<td>E15650</td>
<td>Ink System incompatible with Service Module 1</td>
<td>Service Module 1 is not compatible with the Ink System fluid. Please install a suitable Service Module 1.</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
### Troubleshooting

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E15649          | Service Module 1 / Ink Cartridge Mismatch | The Ink type contained within the Ink Cartridge is not compatible with the Ink type previously used with the fitted Service Module 1. Please install a suitable Ink Cartridge, or replace the Service Module 1 with a new or compatible module. | 1) Improper cartridge or used Service Module 2 has actually been fitted (especially likely after cartridge insertion or Service Module 2 replacement).  
2) Ink Cartridge Smart Chip was programmed incorrectly.  
3) Fluid cartridge was labeled incorrectly.  
4) Defective Service Module 2 (Smart Chip programmed with 'ink type' although new). |
| E15648          | Service Module 1 Insertions Exceeded      | The Service Module 1 has exceeded its allowed number of insertions. Please fit a new Service Module 1. | 1) Run hours consumed.  
2) Service Module 2 Smart Chip was not programmed correctly.  
3) Unrelated event caused Service Module 2 Smart Chip run hours to increment. |
| E15519          | Service Module 1 Replacement Required     | Service Module 1 has reached the end of its usable life. Please replace the Service Module 1. | 1) Run hours consumed.  
2) Service Module 2 Smart Chip was not programmed correctly.  
3) Unrelated event caused Service Module 2 Smart Chip run hours to increment. |
| E15646          | Service Module 1 Replacement Due in %L1 Hours | The Service Module 1 is nearing the end of its usable life. Please ensure that you have a replacement available. | 1) Run hours consumed.  
2) Service Module 2 Smart Chip was not programmed correctly.  
3) Unrelated event caused Service Module 2 Smart Chip run hours to increment. |
| E15??           | Service Module 1 Communication Error      | The Printer is unable to communicate with Service Module 1. Please confirm Service Module 1 is inserted fully and power cycle the printer. If the alarm persists, please contact your local Videojet Service Representative. | 1) Run hours consumed.  
2) Service Module 2 Smart Chip was not programmed correctly.  
3) Unrelated event caused Service Module 2 Smart Chip run hours to increment. |
| E15878          | Firmware Diagnostic Download In Progress | Firmware diagnostic download to the MicroSD card is in progress. Please do not turn off the printer. | 1) Improper cartridge or used Service Module 2 has actually been fitted (especially likely after cartridge insertion or Service Module 2 replacement).  
2) Ink Cartridge Smart Chip was programmed incorrectly.  
3) Fluid cartridge was labeled incorrectly.  
4) Defective Service Module 2 (Smart Chip programmed with 'ink type' although new). |

Table 9-5: Printer Alarms (continued)
### Troubleshooting

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<tr>
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<tbody>
<tr>
<td>E15879</td>
<td>Firmware Diagnostic Download has completed.</td>
<td>Firmware diagnostic download to the MicroSD card is now complete.</td>
<td>1) Faulty connection between the IMB and the Service Module 2 PCB. 2) Defective Service Module 2 (flush pump). 3) Defective IMB.</td>
</tr>
<tr>
<td>E15153</td>
<td>Flush Pump Stalled</td>
<td>The Flush Pump is energised but is not turning. Check the ribbon cable connection between the Mixer Tank and Service Module 2.</td>
<td>1) Faulty connection between the IMB and the Service Module 2 PCB. 2) Defective Service Module 2 (flush pump). 3) Defective IMB.</td>
</tr>
<tr>
<td>E15411</td>
<td>Printhead 1 PCB +24 VDC Out of Range</td>
<td>The Printhead PCB +24 VDC for Printhead 1 is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down voltage. 2) Defective +24 VDC input from Main Control Board. 3) Defective umbilical. 4) Defective Printhead PCB.</td>
</tr>
<tr>
<td>E15659</td>
<td>Printhead 1 PCB +3.3 VDC Power Supply Error</td>
<td>The Printhead PCB +3.3 VDC for Printhead 1 is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down voltage. 2) Defective +5.5 VDC power supply in printhead (’V_HOLD’). 3) Defective Printhead PCB.</td>
</tr>
<tr>
<td>E15419</td>
<td>Printhead 1 PCB +3 VDC Power Supply Error</td>
<td>The Printhead PCB +3 VDC for Printhead 1 is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down the +3.3 VDC Power Supply, the +5 VDC Power Supply, or the -5 VDC Power Supply (all three are used by the +3 VDC Power Supply). 2) Defective Printhead PCB.</td>
</tr>
<tr>
<td>E15427</td>
<td>Printhead 1 PCB +5 VDC Power Supply Error</td>
<td>The Printhead PCB +5 VDC for Printhead 1 is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down voltage. 2) Defective input from +5.5 VDC Power Supply. 3) Defective Printhead PCB.</td>
</tr>
</tbody>
</table>

*Table 9-5: Printer Alarms (continued)*
### Troubleshooting

#### Table 9-5: Printer Alarms (continued)

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| E10701          | Printhead 1 Accelerometer Communications Error | The Printhead PCB is unable to communicate with the onboard Accelerometer. Please contact your local Videojet Service Representative.                                                                 | 1) Communications glitch.  
2) Excessive electrical / electronic noise in vicinity of printer.  
3) Another i2C device on the Printhead PCB i2C bus is generating noise or otherwise impairing communications - remove the Print Module and then the Valve Module to see if Accelerometer comms are restored. (The chip which monitors the head heater temperature is also on the i2C bus, but do note: removing the Valve Module removes the load but not the chip itself from the circuit.  
4) Defective Printhead PCB. |
| E10709          | Printhead 1 Accelerometer Interrupt Error | The reliability of the communications between the Printhead PCB and the accelerometer is suspect. Please cycle power at the earliest convenience in order to clear the device's data registers. | 1) Communications glitch.  
2) Excessive electrical / electronic noise in vicinity of printer.  
3) Another i2C device on the Printhead PCB i2C bus is generating noise or otherwise impairing communications - remove the Print Module and then the Valve Module to see if Accelerometer comms are restored. (The chip which monitors the head heater temperature is also on the i2C bus, but do note: removing the Valve Module removes the load but not the chip itself from the circuit.  
4) Defective Printhead PCB. |
| E15114          | Printhead 1 ADC Offset Initialisation Failed | Printhead 1 ADC Offset failed to initialise. Please contact your local Videojet Service Representative.                                                                                       | 1) Communications glitch.  
2) Excessive electrical / electronic noise in vicinity of printer.  
3) Another i2C device on the Printhead PCB i2C bus is generating noise or otherwise impairing communications - remove the Print Module and then the Valve Module to see if Accelerometer comms are restored. (The chip which monitors the head heater temperature is also on the i2C bus, but do note: removing the Valve Module removes the load but not the chip itself from the circuit.  
4) Defective Printhead PCB. |
## Troubleshooting

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<tr>
<td>E15870</td>
<td>Printhead 1 Automodulation Requires Tuning</td>
<td>Automodulation Tuning is recommended for Printhead 1. If the alarm persists, please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
<tr>
<td>E15862</td>
<td>Printhead 1 Automodulation Voltage Too High</td>
<td>The Automodulation voltage has exceeded the recommended maximum value for Printhead 1. Please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
<tr>
<td>E15854</td>
<td>Printhead 1 Automodulation Voltage Too Low</td>
<td>The Automodulation voltage has dropped below the recommended minimum value for Printhead 1. Please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
<tr>
<td>E15806</td>
<td>Printhead 1 Nozzle Operation Not Optimal</td>
<td>Printhead 1 Nozzle is operating outside optimal Parameters and should be replaced. Please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
<tr>
<td>E15838</td>
<td>Printhead 1 No Phase Frequency</td>
<td>The Printer failed to acquire a good Phase Profile. Please stop the Jet and clean the Printhead.</td>
<td></td>
</tr>
</tbody>
</table>

*Table 9-5: Printer Alarms (continued)*
### Troubleshooting

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| E15303          | Printhead 1 Build-Up Detected | The Printhead may require cleaning. Clean and dry the Printhead at the earliest opportunity in order to sustain the quality of print.                                                                        | 1) Actual ink build-up atop the gutter or on the sensor array (clean the printhead).  
2) Max printed drops exceeded (clean the printhead; if head cleaning is not necessary, then consider resetting the printed drops trigger to a higher, more meaningful number).  
3) Transient - change in light conditions has caused the loss of the gutter optical profile (allow the printer time to re-trim the electronic 'shutter' to rerequire the profile).  
4) Gutter physically moved due to mechanical shock (clean gutter and select 'Clean Gutter' to reestablish profile).  
5) Bad connection between Print Module and Printhead PCB.  
6) Damaged sensor or LED or prism (replace Print Module). |
| E15564          | Printhead 1 Cleaning Recommended | The recommended date for Printhead cleaning as calculated by the printer is approaching. In order to sustain the quality of print, inspect the Printhead at the next opportunity and clean if necessary. | 1) System is working correctly and the recommendation to clean the printhead is appropriate. In this case, the printhead should be cleaned and dried. The printer will automatically reset all related parameters if a reduction in build-up is detected (i.e. the head was cleaned).  
2) Build-up threshold set too low causing the alarm to be asserted too soon.  
3) 'Printed drops' trigger set too low causing the alarm to be asserted too soon.  
4) Anomaly in print rate or rate of build up caused the 'predicted clean date' to be abnormally soon. |
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<tr>
<td>E15521</td>
<td>Printhead 1 Frequency Error</td>
<td>Printhead 1 Operating Frequency is outside the allowed limits. Please restart the Jet. If this alarm persists, please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
</tbody>
</table>
| E15229          | Printhead 1 EHT Module Not Detected       | The EHT Module cannot be detected by the Main Control Board. Turn the printer OFF and check the ribbon cable connection between the Main Control Board and the EHT Module. | 1) Faulty connection between the Main Control Board and the EHT Module.  
2) Defective EHT Module.  
3) Defective Main Control Board. |
| E15380          | Printhead 1 EHT 'OFF' Current Too High or Too Low | Excessive Current was measured in the EHT circuit after the EHT was turned OFF. Please clear the fault before attempting to restart the Ink Jet. | 1) Faulty EHT Module  
2) Defective Main Control Board |
| E15372          | Printhead 1 EHT Current Offset Out of Range | The EHT Current Offset measured by the Printer at initialization is outside of the allowed tolerance. Please cycle power to reset the Current Offset. | 1) Erroneous offset value calculated by the printer at boot-up.  
2) Environmental extreme is affecting circuit sensitivity  
3) Faulty connection between the EHT Module and the Main Control Board  
4) Faulty EHT Module  
5) Defective Main Control Board |
| E15245          | Printhead 1 EHT Voltage Too High or Too Low | The measured EHT Voltage is outside of the allowed tolerance. Please contact your local Videojet Service Representative. | 1) Faulty connection between the Main Control Board and the EHT Module.  
2) Defective EHT Module.  
3) Defective Main Control Board. |

*Table 9-5: Printer Alarms (continued)*
### Troubleshooting

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<tr>
<td>E15237</td>
<td>Printhead 1 EHT trip</td>
<td>The measured EHT Current is outside of the allowed tolerance. Please clean and dry the Printhead before restarting the Ink Jet. Refer to the Service Manual for appropriate safety precautions.</td>
<td>1) Dirty or wet printhead. 2) Ink jet aligned too high in the gutter. 3) Improper drop break-off. 4) Ink viscosity too high or too low. 5) Ink contaminated. 6) Printer is operating in a harsh environment. 7) Contaminants creating a path to ground within the printhead chassis. 8) Defective umbilical. 9) Defective EHT Module. 10) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15630</td>
<td>Printhead 1 EHT Voltage Feedback Error</td>
<td>The Voltages measured by the two channels of the EHT Voltage Monitor do not agree. Turn the Printer OFF and check the ribbon cable connection between the EHT Module and the Main Control Board.</td>
<td>1) Faulty connection between the Main Control Board and the EHT Module (the two feedback channels connect to the main control board at opposite ends of the ribbon cable connector). 2) Defective EHT Module. 3) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15638</td>
<td>Printhead 1 EHT Overvoltage</td>
<td>The measured EHT Voltage exceeded 9000 VDC. Please contact your local Videojet Service Representative.</td>
<td>1) Faulty EHT Module 2) Defective Main Control Board</td>
</tr>
<tr>
<td>E15364</td>
<td>Printhead 1 EHT Voltage Offset Out of Range</td>
<td>The EHT Voltage Offset measured by the Printer at initialization is outside of the allowed tolerance. Please cycle power to reset the Voltage Offset.</td>
<td>1) Erroneous offset value calculated by the printer at boot-up. 2) Environmental extreme is affecting circuit sensitivity. 3) Faulty connection between the EHT Module and the Main Control Board. 4) Faulty EHT Module. 5) Defective Main Control Board.</td>
</tr>
</tbody>
</table>

*Table 9-5: Printer Alarms (continued)*
### Troubleshooting

**E15435**  
**Printhead 1 Gutten Fault Shutdown Disabled**  
The Gutter Fault Shutdown for Printhead 1 is currently disabled. Please enable the Gutter Fault Shutdown at the earliest opportunity.

**E15089**  
**Printhead 1 Gutter Fault**  
Gutter Fault detected on Printhead 1. Ensure that the Gutter is unobstructed and then clean and dry the Printhead.

**Remedial Action**  
1) No ink stream - clog.  
2) No ink stream - pressure problem.  
3) No ink stream - valve.  
4) Misdirected ink stream - partial clog.  
5) Misdirected ink stream - viscosity problem.  
6) Misdirected ink stream - misaligned.  
7) No vacuum - valve.  
8) No vacuum - clog.  
9) No vacuum - venturi.  
10) No vacuum - leak.  
11) Gutter Detect circuit is physically compromised (Printhead PCB - Gutter Pipe - Print Module).  
12) Gutter Detect circuit has electronically failed.  
13) Print Module is poorly fitted.  
14) Ink conductivity issue.

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<tr>
<td>E15435</td>
<td>Printhead 1 Gutter Fault Shutdown Disabled</td>
<td>The Gutter Fault Shutdown for Printhead 1 is currently disabled. Please enable the Gutter Fault Shutdown at the earliest opportunity.</td>
<td>1) Software Menu selection</td>
</tr>
<tr>
<td>E15089</td>
<td>Printhead 1 Gutter Fault</td>
<td>Gutter Fault detected on Printhead 1. Ensure that the Gutter is unobstructed and then clean and dry the Printhead.</td>
<td>1) No ink stream - clog. 2) No ink stream - pressure problem. 3) No ink stream - valve. 4) Misdirected ink stream - partial clog. 5) Misdirected ink stream - viscosity problem. 6) Misdirected ink stream - misaligned. 7) No vacuum - valve. 8) No vacuum - clog. 9) No vacuum - venturi. 10) No vacuum - leak. 11) Gutter Detect circuit is physically compromised (Printhead PCB - Gutter Pipe - Print Module). 12) Gutter Detect circuit has electronically failed. 13) Print Module is poorly fitted. 14) Ink conductivity issue.</td>
</tr>
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*Table 9-5: Printer Alarms (continued)*
## Troubleshooting

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| E15097          | Printhead 1 Gutter Fault      | Gutter Fault detected on Printhead 1. Ensure that the Gutter is unobstructed and then clean and dry the Printhead. | 1) No ink stream - clog.  
2) No ink stream - pressure problem.  
3) No ink stream - valve.  
4) Misdirected ink stream - partial clog.  
5) Misdirected ink stream - viscosity problem.  
6) Misdirected ink stream - misaligned.  
7) No vacuum - valve.  
8) No vacuum - clog.  
9) No vacuum - venturi.  
10) No vacuum - leak.  
11) Gutter Detect circuit is physically compromised (Printhead PCB - Gutter Pipe - Print Module).  
12) Gutter Detect circuit has electronically failed.  
13) Print Module is poorly fitted.  
14) Ink conductivity issue. |
| E15???          | Printhead 1 PCB Communications Error | The Printer is unable to communicate with the Printhead PCB. Please confirm that the Printhead PCB is inserted correctly. If the alarm persists, please contact your local Videojet Service Representative. |                                                                      |
| E15667          | Printhead 1 EHT Trip          | The measured EHT current is outside of the allowed tolerance. Please clean and dry the printhead before restarting the ink jet. Refer to the Service Manual for appropriate safety precautions. |                                                                      |

*Table 9-5: Printer Alarms (continued)*
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<tr>
<td>E15311</td>
<td>Job Too Long</td>
<td>The Job exceeds the maximum Print Width. Please edit the Job to reduce the Print Width before continuing or select a new Job.</td>
<td></td>
</tr>
<tr>
<td>E15595</td>
<td>Printhead 1 Internal Temperature Sensor Error</td>
<td>The Printhead PCB is not receiving a valid signal from the Printhead’s Internal Temperature Sensor. Please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
<tr>
<td>E15479</td>
<td>Printhead 1 Internal Temperature Sensor is an Open Circuit</td>
<td>The Printhead PCB is not receiving a valid signal from the Printhead’s Internal Temperature Sensor. Please contact your local Videojet Service Representative.</td>
<td>1) Defective Printhead PCB.</td>
</tr>
<tr>
<td>E15471</td>
<td>Printhead 1 Internal Temperature Sensor Supply Voltage Too Low</td>
<td>The Supply Voltage to the Printhead’s Internal Temperature Sensor is below the minimum allowed value. Please contact your local Videojet Service Representative.</td>
<td>1) Defective Printhead PCB. 2) Faulty component in the printhead is pulling down the local +5 VDC supply.</td>
</tr>
<tr>
<td>E15335</td>
<td>Printhead 1 Missed Print: Invalid Compensation</td>
<td>Missed Print: The specified compensation requires an unavailable Raster. Please select a different Raster or contact your local Videojet Service Representative.</td>
<td></td>
</tr>
<tr>
<td>E15622</td>
<td>Printhead 1 Invalid Job Adjustment</td>
<td>The Selected Job cannot be printed with the active Line Setup. Please select a new Line Setup from the Line Setup System Tool or within Job Parameters.</td>
<td></td>
</tr>
<tr>
<td>E15783</td>
<td>Printhead 1 Product Delay Out of Range</td>
<td>Printhead 1 Product Delay is outside of the allowed range. Review the PD to PH Distance and increase or decrease as required.</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
## Troubleshooting

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<tbody>
<tr>
<td>E15791</td>
<td>Printhead 1 Width Divider Out of Range</td>
<td>Printhead 1 Width Divider is outside of the allowed range. Review the Width Divider setting and increase or decrease as needed.</td>
<td></td>
</tr>
<tr>
<td>E10719</td>
<td>Printhead 1 Job Not Ready to Print</td>
<td>Printhead 1 Job is not ready to print. Please Run and Load Job.</td>
<td></td>
</tr>
<tr>
<td>E15069</td>
<td>Printhead 1 Connection Lost</td>
<td>The Main Control Board has lost communication with the Printhead PCB. Turn the printer OFF and check the cable connection between the Main Control Board and the Printhead.</td>
<td>1) Faulty connection between the Printhead PCB and the Main Control Board. 2) Defective Printhead PCB. 3) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15077</td>
<td>Printhead 1 Connection Error</td>
<td>The Main Control Board has bad communication with the Printhead PCB. Turn the printer OFF and check the cable connection between the Main Control Board and the Printhead.</td>
<td></td>
</tr>
<tr>
<td>E15031</td>
<td>Modulation Driver Too Hot</td>
<td>The Modulation Drive Circuit on the Main Control Board has exceeded its maximum allowed temperature. Please contact your local Videojet Service Representative.</td>
<td>1) Defective Print Module. 2) Defective Print Module PCB. 3) Defective umbilical. 4) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15651</td>
<td>Printhead 1 PCB -5 VDC Power Supply Error</td>
<td>The Printhead PCB -5 VDC for Printhead 1 is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down voltage. 2) Defective +5.5 VDC power supply in printhead ('V_HOLD'). 3) Defective Printhead PCB.</td>
</tr>
</tbody>
</table>

*Table 9-5: Printer Alarms (continued)*
### Troubleshooting

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</table>
| E15181          | Printhead 1 No Good Phase     | The Printer failed to acquire a good Phase Profile before the timeout occurred. Please stop the Jet and clean the Printhead. | 1) No phasing / velocity - dirty printhead.  
|                 |                               |                                                                                  | 2) No phasing / velocity - bad sensor.  
|                 |                               |                                                                                  | 3) No phasing / velocity - bad fit between Print Module and Printhead PCB.  
|                 |                               |                                                                                  | 4) Ink viscosity out of tolerance.  
|                 |                               |                                                                                  | 5) Bad break-off (nozzle clog).  
|                 |                               |                                                                                  | 6) Bad breakoff (modulation)  
|                 |                               |                                                                                  | 7) Erratic pressure  
|                 |                               |                                                                                  | 8) Noise in phasing/velocity signal, or bad umbilical or connection issue between Main Control Board and Printhead PCB.  
|                 |                               |                                                                                  | 9) Ink conductivity / expiry / oxidized / contaminated.  
|                 |                               |                                                                                  | 10) Defective Printhead PCB (trace).  
|                 |                               |                                                                                  | 11) Defective Main Control Board  
| E15846          | Printhead 1 No Good Phase at Startup | The Printer failed to acquire a good Phase Profile at Startup. Please stop the Jet and clean the Printhead. | |
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</table>
| E15814          | Printhead 1 No Good Phase   | The Printer failed to acquire a good Phase Profile with the phase threshold set to the minimum value. Please stop the Jet and clean the Printhead.                                                            | 1) Printing too fast.  
|                 |                             |                                                                                                                                                                                                           | 2) Printing too slow on shaft encoder - line has paused mid-print.   |
|                 |                             |                                                                                                                                                                                                           | 3) Product detector malfunction - 'fluttering' due to mis-adjustment or moisture. |
|                 |                             |                                                                                                                                                                                                           | 4) No phasing / velocity - dirty printhead.                           |
|                 |                             |                                                                                                                                                                                                           | 5) No phasing / velocity - bad sensor.                                |
|                 |                             |                                                                                                                                                                                                           | 6) No phasing / velocity - bad fit between Print Module and Printhead PCB. |
|                 |                             |                                                                                                                                                                                                           | 7) Ink viscosity out of tolerance.                                   |
|                 |                             |                                                                                                                                                                                                           | 8) Bad break-off (nozzle clog).                                     |
|                 |                             |                                                                                                                                                                                                           | 9) Bad break-off (modulation).                                      |
|                 |                             |                                                                                                                                                                                                           | 10) Erratic pressure.                                                |
|                 |                             |                                                                                                                                                                                                           | 11) Noise in phasing/velocity signal, or bad umbilical or connection issue between Main Control Board and Printhead PCB. |
|                 |                             |                                                                                                                                                                                                           | 12) Ink conductivity / expiry / oxidized / contaminated.             |
|                 |                             |                                                                                                                                                                                                           | 13) Defective printhead PCB (trace).                                |
|                 |                             |                                                                                                                                                                                                           | 14) Defective Main Control Board                                     |
| E15201          | Printhead 1 Velocity Detect Timeout | The Printer failed to acquire valid drop speed data before the timeout occurred. Please reduce the Print Rate / Line Speed and check the Product Detector for correct operation. | 1) Printing too fast.  
|                 |                             |                                                                                                                                                                                                           | 2) Printing too slow on shaft encoder - line has paused mid-print.   |
|                 |                             |                                                                                                                                                                                                           | 3) Product detector malfunction - 'fluttering' due to mis-adjustment or moisture. |
| E15171          | Printhead 1 No Time to Phase | The Printer failed to acquire valid Phase Profile data before the timeout occurred. Please reduce the Print Rate / Line Speed and check the Product Detector for correct operation. | 1) Printing too fast.  
|                 |                             |                                                                                                                                                                                                           | 2) Printing too slow on shaft encoder - line has paused mid-print.   |
|                 |                             |                                                                                                                                                                                                           | 3) Product detector malfunction - 'fluttering' due to mis-adjustment or moisture. |

Table 9-5: Printer Alarms (continued)
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<tr>
<td>E15277</td>
<td>Printhead 1 Missed Print: Out Of Strokes</td>
<td>Missed Print: The print is being missed as the Job was not created in the available time.</td>
<td></td>
</tr>
<tr>
<td>E15295</td>
<td>Printhead 1 Missed Print: Overlap</td>
<td>Missed Print: The Print is being missed due to an overlap with the following print.</td>
<td></td>
</tr>
<tr>
<td>E15287</td>
<td>Printhead 1 Missed Print: Overlap</td>
<td>Missed Print: The Print is being truncated due to an overlap with the following print.</td>
<td></td>
</tr>
<tr>
<td>E15356</td>
<td>Printhead 1: Overspeed</td>
<td>Line speed is too fast for the current Job. Review the Line Speed setting and adjust as needed.</td>
<td></td>
</tr>
<tr>
<td>E15191</td>
<td>Printhead 1 Phase Threshold Error</td>
<td>The Printer was not able to auto-adjust to acquire a good Phase Profile. Please contact your local Videojet Service Representative.</td>
<td>1) Bad fit between Print Module and Printhead PCB. 2) Bad umbilical or connection issue between Main Control Board and Printhead PCB. 3) Bad Print Module 4) Bad Printhead PCB (trace) 5) Bad Main Control Board</td>
</tr>
<tr>
<td>E15583</td>
<td>Printhead 1 PCB Not Fitted Or Invalid</td>
<td>A valid Printhead PCB cannot be detected by the Printer. Please install a suitable Printhead PCB.</td>
<td>1) Printhead PCB is missing. 2) Printhead PCB Smart Chip is not programmed. 3) Faulty connection between the Main Control Board and the Printhead PCB (i.e. bad umbilical). 4) Defective Printhead PCB 5) Defective Main Control Board</td>
</tr>
</tbody>
</table>

*Table 9-5: Printer Alarms (continued)*
### Table 9-5: Printer Alarms (continued)

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
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<th>Cause</th>
</tr>
</thead>
</table>
| E15575          | Printhead 1 Print Module Not Fitted or Invalid            | A valid Print Module cannot be detected by the Printer. Please install a suitable Print Module. | 1) Print Module is missing.  
2) Print Module is not fitted correctly.  
3) Print Module Smart Chip is not programmed.  
4) Defective Print Module.  
5) Defective Printhead PCB. |
| E15269          | Printhead 1 Missed Print: Product Delay too short         | Missed Print: Printhead 1 Product Delay is too short. Review the PD to PH Distance and increase as required. |                                                                                         |
| E15319          | Printhead 1 Missed Print: Product Queue Too Deep          | Missed Print: There are more than 20 products between the Product Detector and the Printhead which are not yet printed. Contact your local Videojet Service Representative. |                                                                                         |
| E15327          | Raster Size Exceeds FPGA Capacity                         | The FPGA failed to program with complete Raster data due to memory limitations. Please cycle power to reprogram the FPGA. | 1) Anomaly during boot-up.  
2) Raster files corrupt.  
3) Bad software build was loaded.  
4) Bad Main Control Board  
5) Check on SD card |
<p>| E15344          | Selected Job Too Long                                     | The selected Job is too long. Please reduce the Job length.                       |                                                                                         |</p>
<table>
<thead>
<tr>
<th>Error Reference</th>
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</tr>
</thead>
</table>
| E15542          | Printhead 1 Accelerometer Peak Shock Level Exceeds Threshold | The Printhead has sustained mechanical shock or Acceleration greater than the recommended limit. If the Printhead was recently dropped while the Ink Jet was running, then inspect the Printhead and clean if necessary. If the Printer is currently employed in a traversing application, then reduce Printhead Acceleration and Deceleration rates in order to maximize Uptime and sustain quality of print. | 1) Occurred accidentally during manual handling.  
2) Mechanical shock due to drop, etc.  
3) Poor substrate control resulted in collision with product on the line.  
4) Poor mounting of printhead / printhead stand is resulting in excessive vibration or shock.  
5) If traversing: ramp-up and ramp-down rates are excessive. |
| E10627          | Printhead 1 Ink Temperature Below Threshold      | The Ink Temperature in Printhead 1 did not reach the required target Temperature. Continue to run the Jet to allow the Temperature to reach target. If the alarm persists, contact your local Videojet Service Representative.                                   |                                                                                                 |
| E15603          | Printhead 1 Heater Communication Error           | The Printer is unable to communicate with the Printhead Heater. Please your local Videojet Service Representative.                                                                                           |                                                                                                 |
| E15161          | Printhead 1 Heater Overtemperature               | The measured Temperature for Printhead 1 is above the maximum allowed limit. Please check the ambient conditions in the vicinity of the Printhead and relocate it if necessary.                  | 1) Ambient temperature exceeds fault trip point.  
2) Heater control issue (software / microcontroller).  
3) Defective temperature sensor.  
4) Adjacent component causing overheating of the circuit.  
5) Cabling in chassis is physically or electronically interfering with the circuit.  
6) Defective printhead PCB.  
7) i²C issue in printhead |

Table 9-5: Printer Alarms (continued)
## Troubleshooting

<table>
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</table>
| E15495          | Printhead 1 Heater Temperature Sensor is an Open Circuit | The Printhead PCB is not receiving a valid signal from the Printhead Heater Temperature Sensor. Ensure that the Print Module is properly fitted.                                                      | 1) Valve Module is not properly fitted.  
2) Spring-loaded contacts on Printhead PCB ‘CON 2’ are out of alignment.  
3) Sensor leads disconnected from Valve Module PCB.  
4) Defective Sensor.  
5) Defective Printhead PCB. |
| E15141          | Printhead 1 Heater Temperature Too High    | The measured Temperature for Printhead 1 is above the normal control band. Please check the ambient conditions in the vicinity of the Printhead and relocate it if necessary.                                        | 1) Ambient temperature exceeds warning trip point.  
2) Heater control issue (software / microcontroller).  
3) Defective temperature sensor.  
4) Adjacent component causing overheating of the circuit.  
5) Cabling in chassis is physically or electronically interfering with the circuit.  
6) Defective printhead PCB.  
7) i2C issue in printhead |
| E15131          | Printhead 1 Heater Temperature Too Low     | The measured Temperature for Printhead 1 is below the normal control band. Please check the ambient conditions in the vicinity of the Printhead and relocate it if necessary.                                        | 1) Poor fit - Valve Module to chassis.  
2) Ambient extreme.  
3) Heater defective (blown thermal cutout).  
4) Heater not turned on (software issue).  
5) Defective temperature sensor.  
6) Defective printhead PCB.  
7) i2C issue in printhead |
| E15487          | Printhead 1 Heater Temperature Sensor Supply Voltage Too Low | The Supply Voltage to the Printhead Heater Temperature Sensor circuit is below the minimum allowed value. Please contact your local Videojet Service Representative.                                              | 1) Defective Printhead PCB.  
2) Faulty component in the printhead is pulling down the local +5 VDC supply.                  |

Table 9-5: Printer Alarms (continued)
<table>
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<tbody>
<tr>
<td>E15446</td>
<td>Printhead 1 Flight Time Compensation Error</td>
<td>Due to excessive Line Speed, the printer is unable to maintain the Print Margin established for this job. Increase the PD to PH distance, reduce the programmed 'Printhead Throw Distance' or reduce the Line Speed after moving the printhead closer to the substrate. If precise code placement is not required, then utilize the 'Warning Suppression' option to prevent assertion of this warning.</td>
<td>1) Line speed too high (reduce line speed, reprogram Line Setup if using internal encoding). 2) PD to PH Distance too low (move product detector upstream and reprogram Line Setup). 3) Printhead Throw Distance too high (move printhead closer to substrate and reprogram Line Setup) 4) Wrong matrix selected for job (auto-select turned off) 5) Print Margin too low</td>
</tr>
<tr>
<td>E15211</td>
<td>Printhead 1 Drop Velocity Too High</td>
<td>The measured ink drop speed for Printhead 1 is above the allowed tolerance. If possible, please refrain from printing until the drop speed has auto-corrected and the warning has cleared.</td>
<td>1) Normal transient during printer startup. 2) Ink is too thin. 3) Partial nozzle clog causing irregular break-off. 4) Pressure transducer not reading correct pressure. 5) Printer sequence does not include the correct pump control mnemonic ('AR3').</td>
</tr>
<tr>
<td>E15221</td>
<td>Printhead 1 Drop Velocity Too Low</td>
<td>The measured ink drop speed for Printhead 1 is below the allowed tolerance. If possible, please refrain from printing until the drop speed has auto-corrected and the warning has cleared.</td>
<td>1) Normal transient during printer startup. 2) Ink is too thick. 3) Partial nozzle clog causing irregular break-off. 4) Pressure transducer not reading correct pressure. 5) Printer sequence does not include the correct pump control mnemonic ('AR3').</td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
### Troubleshooting

#### E15532

**Printhead 1 Too Many Holes in Phase Profile**

The Printer's Phase Profile is unstable. This may adversely affect the print quality. If the warning fails to clear, then please stop the Jet and clean the Printhead if necessary.

1) Transient during jet start-up (not an abnormality).
2) Phasing sensor is dirty.
3) Ink viscosity out of tolerance
4) Bad break-off (nozzle partial clog).
5) Bad break-off (modulation setting).
6) Erratic pressure / velocity.
7) Noise in phasing signal.
8) Ink conductivity / expiry / oxidized / contaminated.

#### E10672

**Printhead 1 Valve Current Offset Out of Range**

The Current Offset measured by the Printer at initialization for the Printhead valves is outside of the allowed tolerance. Please cycle power to reset the Current Offset.

1) Erroneous offset value calculated by the printer at boot-up.
2) Environmental extreme is affecting circuit sensitivity
3) Mismatch between software and hardware - the 'offset' limitation is not appropriate for the hardware in use.
4) Short circuit in one or more valves (run hardware self-test or valve test)
5) Defective Printhead PCB

#### E10682

**Printhead 1 Valve Current Too High**

The Current measured in the Valve Drive circuit is too high for the number of Valves in use. Stop the Jet and run a Hardware Test to check Valve functionality.

1) Mismatch between software and hardware - the coded current tolerance is not appropriate for the hardware in use.
2) Short circuit in one or more valves (run hardware self-test or valve test)
3) Defective Printhead PCB.

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<th>Cause</th>
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</table>
| E15532          | Printhead 1 Too Many Holes in Phase Profile | The Printer's Phase Profile is unstable. This may adversely affect the print quality. If the warning fails to clear, then please stop the Jet and clean the Printhead if necessary. | 1) Transient during jet start-up (not an abnormality).
|                 |                                          |                                                                                 | 2) Phasing sensor is dirty.
|                 |                                          |                                                                                 | 3) Ink viscosity out of tolerance
|                 |                                          |                                                                                 | 4) Bad break-off (nozzle partial clog).
|                 |                                          |                                                                                 | 5) Bad break-off (modulation setting).
|                 |                                          |                                                                                 | 6) Erratic pressure / velocity.
|                 |                                          |                                                                                 | 7) Noise in phasing signal.
|                 |                                          |                                                                                 | 8) Ink conductivity / expiry / oxidized / contaminated.                                          |
| E10672          | Printhead 1 Valve Current Offset Out of Range | The Current Offset measured by the Printer at initialization for the Printhead valves is outside of the allowed tolerance. Please cycle power to reset the Current Offset. | 1) Erroneous offset value calculated by the printer at boot-up.
|                 |                                          |                                                                                 | 2) Environmental extreme is affecting circuit sensitivity
|                 |                                          |                                                                                 | 3) Mismatch between software and hardware - the 'offset' limitation is not appropriate for the hardware in use.
|                 |                                          |                                                                                 | 4) Short circuit in one or more valves (run hardware self-test or valve test)
|                 |                                          |                                                                                 | 5) Defective Printhead PCB                                                                 |
| E10682          | Printhead 1 Valve Current Too High        | The Current measured in the Valve Drive circuit is too high for the number of Valves in use. Stop the Jet and run a Hardware Test to check Valve functionality. | 1) Mismatch between software and hardware - the coded current tolerance is not appropriate for the hardware in use.
|                 |                                          |                                                                                 | 2) Short circuit in one or more valves (run hardware self-test or valve test)
<p>|                 |                                          |                                                                                 | 3) Defective Printhead PCB                                                                       |</p>
<table>
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</tr>
</thead>
</table>
| E10690          | Printhead 1 Valve Current Too Low | The Current measured in the Valve Drive circuit is too low for the number of Valves in use. Stop the Jet and run a Hardware Test to check Valve functionality. | 1) Mismatch between software and hardware - the coded current tolerance is not appropriate for the hardware in use.  
2) Environmental extreme, or excessive cycling of valves has affected circuit sensitivity or valve resistivity.  
3) Open circuit in one or more valves (should be reported as soon as jet is stopped and valve is shut; run hardware self-test or valve test).  
4) Defective Printhead PCB |
| E15767          | Printhead 1 Valve Driver Power Supply Warning | The Supply Voltage to the Valve Driver chip for Printhead 1 is outside of the allowed tolerance. Please turn the Printer OFF and check the connection between the Main Control Board and the Printhead. | 1) External load is pulling down +24 VDC in printhead.  
2) Defective Printhead PCB.  
3) Defective Mains Power Supply.  
4) Defective umbilical.  
5) Defective Main Control Board. |
| E15775          | Printhead 1 Valve Driver Thermal Warning | The Valve Driver chip for Printhead 1 has overheated. Please stop the Jet and refrain from operating the Printer until the condition has cleared. | 1) Excessive valve operation (scratchpad, flush kit etc.).  
2) Printer/printhead operation in extreme ambient conditions.  
3) Short circuit in valve(s).  
4) Defective U81 (replace Printhead PCB). |
| E15703          | Printhead 1 Valve VF is an Open Circuit | The Printhead PCB failed to confirm that Valve VF is properly connected to the Printhead's electrical system. Ensure that the Print Module is properly fitted. | 1) Valve Module is not properly fitted.  
2) Spring-loaded contacts on Printhead PCB 'CON 2' are out of alignment.  
3) Valve failure (replace Valve Module).  
4) Defective Printhead PCB (U81, trace, or component failure). |

*Table 9-5: Printer Alarms (continued)*
<table>
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<tr>
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<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15711</td>
<td>Printhead 1 Valve VF is a Short Circuit</td>
<td>Excessive Current was detected when attempting to operate Valve VF. Please check the integrity of the Valve's connectors.</td>
<td>1) Loss of integrity of valve wires. 2) Foreign substance within the printhead chassis has created a short. 3) Valve Failure (replace Valve Module). 4) Defective Printhead PCB.</td>
</tr>
<tr>
<td>E15751</td>
<td>Printhead 1 Valve VG is an Open Circuit</td>
<td>The Printhead PCB failed to confirm that Valve VG is properly connected to the Printhead's electrical system. Ensure that the Print Module is properly fitted.</td>
<td>1) Valve Module is not properly fitted. 2) Spring-loaded contacts on Printhead PCB 'CON 2' are out of alignment. 3) Valve failure (replace Valve Module). 4) Defective Printhead PCB (U81, trace, or component failure).</td>
</tr>
<tr>
<td>E15759</td>
<td>Printhead 1 Valve VG is a Short Circuit</td>
<td>Excessive Current was detected when attempting to operate Valve VG. Please check the integrity of the Valve's connectors.</td>
<td>1) Loss of integrity of valve wires. 2) Foreign substance within the printhead chassis has created a short. 3) Valve Failure (replace Valve Module). 4) Defective Printhead PCB.</td>
</tr>
<tr>
<td>E15719</td>
<td>Printhead 1 Valve VL is an Open Circuit</td>
<td>The Printhead PCB failed to confirm that Valve VL is properly connected to the Printhead's electrical system. Ensure that the Print Module is properly fitted.</td>
<td>1) Valve Module is not properly fitted. 2) Spring-loaded contacts on Printhead PCB 'CON 2' are out of alignment. 3) Valve failure (replace Valve Module). 4) Defective Printhead PCB (U81, trace, or component failure).</td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E15727          | Printhead 1 Valve VL is a Short Circuit   | Excessive Current was detected when attempting to operate Valve VL. Please check the integrity of the Valve's connectors. | 1) Loss of integrity of valve wires.  
2) Foreign substance within the printhead chassis has created a short.  
3) Valve Failure (replace Valve Module).  
4) Defective Printhead PCB. |
| E15735          | Printhead 1 Valve VP is an Open Circuit   | The Printhead PCB failed to confirm that Valve VP is properly connected to the Printhead's electrical system. Ensure that the Printhead Module is properly fitted. | 1) Valve Module is not properly fitted.  
2) Spring-loaded contacts on Printhead PCB 'CON 2' are out of alignment.  
3) Valve failure (replace Valve Module).  
4) Defective Printhead PCB (U81, trace, or component failure). |
| E15743          | Printhead 1 Valve VP is a Short Circuit   | Excessive Current was detected when attempting to operate Valve VP. Please check the integrity of the Valve's connectors. | 1) Loss of integrity of valve wires.  
2) Foreign substance within the printhead chassis has created a short.  
3) Valve Failure (replace Valve Module).  
4) Defective Printhead PCB. |
| E15403          | Printhead 1 PCB V HOLD Power Supply Error | The Printhead PCB V HOLD (+5.5 VDC) for Printhead 1 is outside of the allowed tolerance. Please contact your local Videojet Service Representative. | 1) External load is pulling down voltage.  
2) Defective +24 VDC input from Main Control Board.  
3) Defective Printhead PCB. |
| E15552          | Heater Exit Temperature Sensor Supply Voltage Invalid | The supply voltage to the Heater Exit Temperature Sensor is outside the allowed range. Please contact your local Videojet Service Representative. |                                                                                           |

*Table 9-5: Printer Alarms (continued)*
<table>
<thead>
<tr>
<th>Error Reference</th>
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<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E10619</td>
<td>Invalid Main Control Board</td>
<td>A valid Main Control Board cannot be detected. Please contact your local Videojet Service representative.</td>
<td>1) Defective Main Control Board</td>
</tr>
<tr>
<td>E10718</td>
<td>IMB Programming Error</td>
<td>The Ink Management Board is unable to read fluid data from the printer. Please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
</tbody>
</table>
| E10620          | Invalid Ink Management Board   | A valid Ink Management Board cannot be detected by the Main Control Board. Please contact your local Videojet Service Representative. | 1) (if asserted with E15067) Bad connection between Main Control Board and IMB.  
2) Defective IMB (unprogrammed or incorrectly programmed Smart Chip) |
| E15573          | Incompatible Modulation       | The Modulation is not correct for the Ink Type. Please contact your local Service Representative. |                                                                                             |
| E15046          | Information Manager Error     | An unexpected Information Manager Error has occurred. Please contact your local Videojet Service Representative. |                                                                                             |

*Table 9-5: Printer Alarms (continued)*
**Troubleshooting**

<table>
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<th>Cause</th>
</tr>
</thead>
</table>
| E15556          | No Ink Cartridge            | The printer cannot detect the presence of a Cartridge in the Ink slot. Please fit a suitable Ink Cartridge. | 1) Cartridge is missing.  
2) Cartridge is not fitted correctly.  
3) Communications glitch (see NOTE below).  
4) Smart Chip is not programmed.  
5) Faulty connection between the Ink Management PCB and the Service Module 2.  
6) Defective Service Module 2.  
7) Defective Ink Management PCB.  

**NOTE:** The Smart Chip Supplies and Parts Validation System utilizes 'time-outs' in inter-chip communications and also has a 'sleep mode' in order to reduce power consumption (heat generation) during periods of inactivity. IF this warning is asserted following the insertion of a new cartridge, then it may be helpful to REMOVE and REINSERT the cartridge (since Smart Chip authentication is initiated following a CHANGE in the status of the slot). |
| E15048          | Ink Cartridge Empty         | The Ink Cartridge is empty. Please fit a suitable Ink Cartridge.                | 1) Ink Cartridge depleted.                                 |
| E10625          | Ink Cartridge Expired       | The Ink Cartridge has reached the end of its usable life. Please fit a suitable Ink Cartridge. | 1) Cartridge is actually expired.  
2) Printer date is set incorrectly.  
3) Smart Chip mis-programmed |
| E10727          | Evacuated Cartridge in Ink Slot | The Cartridge in the Ink slot is a pre-evacuated empty Cartridge supplied by Videojet. |                                                            |

Table 9-5: Printer Alarms (continued)
<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>E10700</td>
<td>Waste Cartridge in Ink Slot Full</td>
<td>The Cartridge in the Ink slot is full with waste fluid. Please replace it with an empty Evacuated Cartridge to continue Empty &amp; Clean System operation.</td>
<td></td>
</tr>
</tbody>
</table>
| E15286          | Incorrect Ink Type                  | The Cartridge in the Ink slot is of the wrong type (%1). Please fit a %2 Ink Cartridge. | 1) Improper cartridge fitted.  
2) Ink Cartridge Smart Chip was programmed incorrectly.  
3) Fluid cartridge was labeled incorrectly.  
4) IMB Smart Chip failed to program/update correctly. |
| E10621          | Wrong Cartridge in Make-up Slot     | The Cartridge in the Make-up slot contains Ink. Please fit a suitable Make-up Cartridge. | 1) Improper cartridge fitted.  
2) Ink Cartridge Smart Chip was programmed incorrectly.  
3) Fluid cartridge was labeled incorrectly. |
| E10636          | Ink Cartridge Communication Error   | The IMB is unable to communicate with the Ink Cartridge. Please confirm that the Ink Cartridge is inserted fully and power cycle the printer. If the alarm persists, please contact your local Videojet Service Representative. |                                                                                           |
| E10698          | Waste Cartridge in Ink Slot         | The cartridge in the ink slot has been used for waste. This cannot be used for normal operation. |                                                                                           |
| E15520          | Ink conductivity too low.           | Ink conductivity too low.                                                        |                                                                                           |
| E10623          | Ink Cartridge Insertions Exceeded   | The Cartridge in the Ink slot has exceeded its allowed number of insertions. Please fit a suitable Ink Cartridge. | 1) Number of allowed insertions actually exceeded.  
2) Cartridge programmed incorrectly.  
3) Unrelated event caused 'insertions' parameter to increment |

Table 9-5: Printer Alarms (continued)
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<tbody>
<tr>
<td>E10639</td>
<td>IMB Fluid Data Incompatible With Nozzle Size</td>
<td>The Fluid Data contained within the IMB is not compatible with the Nozzle size of the Print Module. Please update the Fluid Data on the IMB, or replace the Print Module with one of the correct Nozzle size.</td>
<td>1) Improper cartridge or improper Print Module has actually been fitted (especially likely after cartridge or Print Module replacement). 2) Ink Cartridge Smart Chip was programmed incorrectly. 3) Fluid cartridge was labeled incorrectly. 4) Defective Print Module (Smart Chip programmed incorrectly).</td>
</tr>
<tr>
<td>E15647</td>
<td>Ink Type Incompatible With Nozzle Size</td>
<td>The Ink Type contained within the Ink Cartridge is not compatible with the Nozzle size of the Print Module. Please install a suitable Ink Cartridge, or replace the Print Module with one of the correct Nozzle size.</td>
<td></td>
</tr>
<tr>
<td>E15799</td>
<td>Make-up Type Incompatible With Nozzle Size</td>
<td>The Make-up Type contained within the Make-up Cartridge is not compatible with the Nozzle size of the Print Module. Please install a suitable Make-up Cartridge, or replace the Print Module with one of the correct Nozzle size.</td>
<td></td>
</tr>
<tr>
<td>E15002</td>
<td>Ink Pump Drive Near Maximum</td>
<td>The Ink Pump Controller is operating at maximum drive. Turn the printer off and inspect the Ink Compartment for leaks.</td>
<td>1) Ink leak. 2) Faulty connection between the IMB and the ink pump. 3) Faulty connection between the IMB and the pressure transducer. 4) Defective Pressure Transducer. 5) Defective Ink Pump. 6) Defective IMB.</td>
</tr>
</tbody>
</table>

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</table>
| E15005          | Ink Pump Fault            | The Ink Pump generated insufficient pressure at maximum drive. Turn the printer off and inspect the Ink Compartment for leaks. | 1) Ink leak.  
2) Faulty connection between the IMB and the ink pump.  
3) Faulty connection between the IMB and the pressure transducer.  
4) Defective Pressure Transducer.  
5) Defective Ink Pump.  
6) Defective IMB. |
| E15009          | Ink Pump Pressure Too High| The Ink Pump discharge pressure is above target. Please contact your local Videojet Service representative. | 1) Defective pressure transducer.  
2) Defective IMB. |
| E15003          | Ink Pressure Too Low      | The Ink Pump discharge pressure is below target. Turn the printer off and inspect the Ink Compartment for leaks. | 1) Ink leak.  
2) Faulty connection between the IMB and the ink pump.  
3) Faulty connection between the IMB and the pressure transducer.  
4) Defective Pressure Transducer.  
5) Defective Ink Pump.  
6) Defective IMB. |
| E15001          | Ink Pump Not Turning      | The Ink Pump is energised but is not turning. Please contact your local Videojet Service representative. | 1) Faulty connection between the IMB and the ink pump.  
2) Defective ink pump (electrical).  
3) Defective ink pump (mechanical).  
4) Defective IMB. |

*Table 9-5: Printer Alarms (continued)*
### Troubleshooting

**Warning**

The Ink Pump is generating insufficient pressure at maximum drive. Turn the printer off and inspect the Ink Compartment for leaks.

1. Ink leak.
2. Faulty connection between the IMB and the ink pump.
3. Faulty connection between the IMB and the pressure transducer.
4. Defective Pressure Transducer.
5. Defective Ink Pump.
6. Defective IMB.

**E15402**

**Ink management**

3.3v out of range

The 3.3v supply on the ink management board is outside the expected range.

1. External load is pulling down voltage.
2. +5 VDC Power Supply output outside of tolerances.
3. Defective Ink Management PCB.

**E15398**

**Ink management**

3v out of range

The 3v supply on the ink management board is outside the expected range.

**E15401**

**Ink management**

5v out of range

The 5v supply on the ink management board is outside the expected range.

1. External load is pulling down voltage.
2. Defective +24 VDC input from Main Control Board.
3. Defective Ink Management PCB.

**E15051**

**Ink Compartment**

Fan Not Turning

The Ink Compartment Fan is not rotating. Please open the Ink Compartment Door and inspect the Fan for proper operation.

1. Fan is unplugged.
2. Fan blades are obstructed.
3. Fan failure.
4. Fan drive or sensing circuit failure (bad IMB).

---

**Table 9-5: Printer Alarms (continued)**
## Troubleshooting

### E15541 Ink Compartment Gas Concentration Exceeds Threshold

The printer has detected the presence of an abnormally high concentration of Solvent vapors within the Ink Compartment. Please inspect the Ink Compartment for leaks.

1) Fluid leak / spill in Ink Compartment.
2) Printer cabinet / components were cleaned with solvent and sufficient drying has not yet occurred.
3) Breather tube disconnected and Ink System is venting to the Ink Compartment air space.
4) Ink compartment fan is disconnected and poor air circulation is occurring.
5) Air filter is clogged and poor air circulation is occurring.
6) Printer is operating in a hazardous environment.
7) 'Gas Sensor Offset' on Service Module 2 Smart Chip is programmed incorrectly and therefore printer calculation of fume level is incorrect.
8) 'Make-up Type' on Ink Cartridge Smart Chip is programmed incorrectly and therefore printer calculation of 'fume level' is incorrect.
9) Gas Sensor (Service Module 2) is defective.
10) IMB is defective.

### E10635 Ink System Missing Data

The Ink System Data cannot be found and no valid backup exists. Please contact your local Videojet Representative.

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E15541          | Ink Compartment Gas Concentration Exceeds Threshold | The printer has detected the presence of an abnormally high concentration of Solvent vapors within the Ink Compartment. Please inspect the Ink Compartment for leaks. | 1) Fluid leak / spill in Ink Compartment.  
2) Printer cabinet / components were cleaned with solvent and sufficient drying has not yet occurred.  
3) Breather tube disconnected and Ink System is venting to the Ink Compartment air space.  
4) Ink compartment fan is disconnected and poor air circulation is occurring.  
5) Air filter is clogged and poor air circulation is occurring.  
6) Printer is operating in a hazardous environment.  
7) 'Gas Sensor Offset' on Service Module 2 Smart Chip is programmed incorrectly and therefore printer calculation of fume level is incorrect.  
8) 'Make-up Type' on Ink Cartridge Smart Chip is programmed incorrectly and therefore printer calculation of 'fume level' is incorrect.  
9) Gas Sensor (Service Module 2) is defective.  
10) IMB is defective. |
| E10635          | Ink System Missing Data      | The Ink System Data cannot be found and no valid backup exists. Please contact your local Videojet Representative. |                                                                                                                                               |

*Table 9-5: Printer Alarms (continued)*
Troubleshooting

**E15540**
Ink Compartment Humidity Exceeds Threshold

The printer has detected the presence of abnormally high humidity within the Ink Compartment. Please ensure that the Ink Compartment Door is properly shut.

1) Printer is operating in extreme environmental conditions (ensure that proper air dryer kit is fitted).
2) Washdown conducted in the vicinity of the printer.
3) Printer in operation without the Ink Compartment door properly secured.
4) Cabinet integrity otherwise compromised.
5) Air filter / filter element not installed.
6) Ink compartment fan is disconnected and poor air circulation is occurring.
7) Defective humidity sensor (defective IMB).

**E15400**
Ink Management PCB -5 VDC Power Supply Error

The Ink Management PCB -5 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.

1) +5 VDC Power Supply output outside of tolerances.
2) Defective Ink Management PCB.

**E15399**
Ink Management PCB Ink Pump Supply Voltage Out of Range

The Ink Management PCB Ink Pump Supply Voltage is outside of the allowed tolerance. Please check the connection between the Main Control Board and the Ink Management PCB.

1) Thermal event has caused F1 on the IMB to open.
2) External load on the IMB or Service Module 2 is pulling down +24 VDC.
3) Defective Ink Pump.
4) Loss of +24VDC from the Main Control Board (other warnings will likely be asserted).
5) Defective Ink Management PCB.

*Table 9-5: Printer Alarms (continued)*
### Troubleshooting

#### E15619  Humidity Sensor Communications Error

- **Remedial Action**: The Ink Management PCB is unable to communicate with the onboard Humidity Sensor. Please contact your local Videojet Service Representative.
- **Cause**:
  1. Communications glitch.
  2. Excessive electrical / electronic noise in vicinity of printer.
  3. Another i2C device on the IMB bus is generating noise or otherwise impairing communications - remove plug-in devices to see if Humidity Sensor communications are restored.
  4. Defective Ink Management Board

#### E15620  Valve Current Sensor Communications Error

- **Remedial Action**: The Ink Management PCB is unable to communicate with the Valve Current Sensor. Please contact your local Videojet Service Representative.

#### E15151  Ink Viscosity Too High

- **Remedial Action**: The Ink is too thick. Check the Make-up Tank level and re-prime the tank if necessary.
- **Cause**:
  1. Ink is actually too thick due to Make-up Tank level issue, although E15062 should protect against this.
  2. Viscometer drain partially clogged.
  3. Make-up Tank level sensor failure (empty without alarm asserted).
  4. Make-up add flowpath compromised (Make-up Tank to Service Module 2 to Mixer Tank venturi)
  5. Valve failure - VR or VJ.
  8. Smart Chip programming issue (incorrect coefficients).
  9. Viscometer quality problem (tolerances of level rods or drain).
  10. Ink temperature sensor not reading the correct temperature.

*Table 9-5: Printer Alarms (continued)*
<table>
<thead>
<tr>
<th>Error Reference</th>
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</tr>
</thead>
</table>
| E15150          | Ink Viscosity Too Low                    | The Ink is too thin. Please continue to run the Ink Jet if possible and avoid actions that will result in further dilution, including Clean Stop/Start and Nozzle Flushing. | 1) Ink is actually too thin due to operator error.  
2) Residual fluid at installation or during component replacement.  
3) Ink quality issue.  
4) Smart Chip programming issue (incorrect coefficients).  
5) Viscometer quality problem (tolerances of level rods or drain).  
6) Ink temperature sensor not reading the correct temperature.  
7) Viscometer overflow is blocked; chamber is pressurized. |
| E15343          | Installation Not Complete                 | The Installation procedure is not complete. Please go to the Installation System Tool to review progress. |                                                                                   |
| E15209          | Diagnostic Log File is Invalid           | The Diagnostic Log File is invalid and cannot be exported to USB. Please contact your local Videojet Service Representative. |                                                                                   |
| E15041          | Invalid Filename                          | The Filename is invalid. Please locate and resave the File with a unique name.                       |                                                                                   |
| E15154          | 'Quick' Stop due to Operator Selection    | The printer performed a 'Quick' Stop due to Operator selection. To avoid start up issues, restart the Ink Jet at the earliest opportunity. Inspect the Printhead prior to start up and clean if necessary. | 1) Manual selection via UI                                                    |
| E15388          | Kernel Tracker Start Failed              | The Kernel Tracker cannot be started.                                                                 |                                                                                   |

*Table 9-5: Printer Alarms (continued)*
### Troubleshooting

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E15558          | Main Control Board FPGA Communication Error | The printer is unable to communicate with the Main Control Board FPGA. Please cycle power in order to reset the FPGA. | 1) Communication glitch.  
2) Defective SD card.  
3) Defective Main Control Board |
| E15800          | Main Board FPGA Programming Error          | The Main Board FPGA does not contain the required programme to proceed. Please contact your local Videojet Service Representative. |                                                                                           |
| E15088          | Main Board FPGA Unprogrammed              | The Main Board FPGA does not contain the required programme to proceed. Please contact your local Videojet Service Representative. |                                                                                           |
| E15557          | No Make-up Cartridge                      | The printer cannot detect the presence of a Cartridge in the Make-up slot. Please fit a suitable Make-up Cartridge. | 1) Cartridge is missing.  
2) Cartridge is not fitted correctly.  
3) Communications glitch (see note below).  
4) Smart Chip is not programmed.  
5) Faulty connection between the Ink Management PCB and the Service Module 2.  
6) Defective Service Module 2.  
7) Defective Ink Management PCB. |

**NOTE:** The Smart Chip Supplies and Parts Validation System utilizes 'time-outs' in inter-chip communications and also has a 'sleep mode' in order to reduce power consumption (heat generation) during periods of inactivity. If this warning is asserted following the insertion of a new cartridge, then it may be helpful to REMOVE and REINSERT the cartridge (since Smart Chip authentication is initiated following a CHANGE in the status of the slot).

---

Table 9-5: Printer Alarms (continued)
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15050</td>
<td>Make-up Cartridge Empty</td>
<td>The Make-up Cartridge is empty. Please fit a suitable Make-up Cartridge.</td>
<td>1) Make-up Cartridge depleted.</td>
</tr>
<tr>
<td>E10626</td>
<td>Make-up Cartridge Expired</td>
<td>The Make-up Cartridge has reached the end of its usable life. Please fit a suitable Make-up Cartridge.</td>
<td>1) Cartridge is actually expired. 2) Printer date is set incorrectly. 3) Smart Chip mis-programmed.</td>
</tr>
<tr>
<td>E10728</td>
<td>Evacuated Cartridge in Make-up Slot</td>
<td>The Cartridge in the Make-up slot is a pre-evacuated empty Cartridge supplied by Videojet.</td>
<td></td>
</tr>
<tr>
<td>E15285</td>
<td>Incorrect Make-up Type</td>
<td>The cartridge in the Make-up slot is of the wrong type (%1). Please fit a %2 Make-up Cartridge.</td>
<td>1) Improper cartridge fitted. 2) Make-up Cartridge Smart Chip was programmed incorrectly. 3) Fluid cartridge was labeled incorrectly. 4) IMB Smart Chip failed to program/update correctly.</td>
</tr>
<tr>
<td>E10622</td>
<td>Wrong Cartridge in Ink Slot</td>
<td>The cartridge in the Ink slot contains Make-up. Please fit a suitable Ink Cartridge.</td>
<td>1) Improper cartridge fitted. 2) Ink Cartridge Smart Chip was programmed incorrectly. 3) Fluid cartridge was labeled incorrectly.</td>
</tr>
<tr>
<td>E10637</td>
<td>Make-up Cartridge Communications Error</td>
<td>The IMB is unable to communicate with the Make-up Cartridge. Please confirm that the Make-up Cartridge is inserted fully and power cycle the printer. If the alarm persists, please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E10699</td>
<td>Waste Cartridge in Make-up Slot</td>
<td>The Cartridge in the Make-up slot has been used for waste. This cannot be used for normal operation. Please remove and insert a suitable Make-up Cartridge.</td>
<td></td>
</tr>
<tr>
<td>E10624</td>
<td>Make-up Cartridge Insertions Exceeded</td>
<td>The Cartridge in the Make-up slot has exceeded its allowed number of insertions. Please fit a suitable Make-up Cartridge.</td>
<td>1) Number of allowed insertions actually exceeded. 2) Cartridge programmed incorrectly. 3) Unrelated event caused 'insertions' parameter to increment</td>
</tr>
<tr>
<td>E15061</td>
<td>Make-up Tank Empty</td>
<td>The Make-up Tank is empty. Please check the Make-up Cartridge and fit a suitable replacement if necessary.</td>
<td>1) Make-up Cartridge Empty. 2) No Make-up Cartridge. 3) Wrong Make-up Cartridge. 4) Expired Make-up Cartridge. 5) Make-up Cartridge incorrectly fitted. 6) Service Module 2 failure (valves, flush pump). 7) Bad Level Sensor. 8) Bad IMB (valve drivers)</td>
</tr>
<tr>
<td>E15062</td>
<td>Make-up Tank Empty</td>
<td>The Make-up Tank is empty. Please fit a suitable Make-up Cartridge and perform 'Prime Make-up Tank' before restarting the jet.</td>
<td>1) Make-up Cartridge Empty. 2) No Make-up Cartridge. 3) Wrong Make-up Cartridge. 4) Expired Make-up Cartridge. 5) Make-up Cartridge incorrectly fitted. 6) Service Module 2 failure (valves, flush pump). 7) Bad Level Sensor. 8) Bad IMB (valve drivers)</td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
<table>
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<tr>
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<th>Cause</th>
</tr>
</thead>
</table>
| E15053          | Make-up Tank Level Sensor Error | The printer has not received a valid response from the Make-up Tank Level Sensor. Please turn the printer off and confirm that the sensor is plugged into the Ink Management PCB. | 1) Level sensor unplugged.  
2) Level sensor miswired.  
3) Bad level sensor connector.  
4) Mixer Tank sensor installed in place of Make-up Tank sensor.  
5) Make-up Tank sensor addressed incorrectly.  
6) Sensor failure.  
7) Bad IMB                                                                                      |
| E15059          | Make-up Tank High           | The level of fluid in the Make-up Tank is above the allowed limit. Please continue to run the Ink Jet if possible and avoid actions that will result in the introduction of additional Make-up into the system, including Clean Stop/Start and Nozzle Flushing. | 1) High level in tank due to excessive starts and stops, or excessive nozzle flushing. Note that these events do not raise the level directly, but will cause it to increase over time due to the vent/condenser.  
2) Printer / tank is not level.  
3) Carryover from Mixer Tank.  
4) Environmental extreme caused condensing of water.  
5) Peltier condenser creating too great of a ΔT causing condensing of water.  
6) Defective Level Sensor                                                                 |
| E15060          | Make-up Tank Low            | The level of fluid in the Make-up Tank is below the allowed limit. Please check the Make-up Cartridge and fit a suitable replacement if necessary.                                                                 | 1) Make-up Cartridge Empty.  
2) No Make-up Cartridge.  
3) Wrong Make-up Cartridge.  
4) Expired Make-up Cartridge.  
5) Make-up Cartridge incorrectly fitted.  
6) Service Module 2 failure (valves, flush pump).  
7) Bad Level Sensor.  
8) Bad IMB (valve drivers)                                                                                                                                |

Table 9-5: Printer Alarms (continued)
# Troubleshooting

<table>
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<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E15039          | Make-up Tank Not Filling      | The Make-up Tank has failed to fill in the allowed time. Please check the Make-up Cartridge and fit a suitable replacement Cartridge if necessary. | 1) Make-up cartridge physically empty but ok per Smart Chip.  
2) Service Module 2 failure (valves or flush pump) (Check if plugged in; run Hardware Test to confirm faulty component and replace) .  
3) Failed level sensor (Replace Ink System).  
4) Failed IMB (Valve driver circuits) |
| E15352          | Make-up Tank Level Sensor Out of Range | The Make-up Tank Level Sensor is reporting a value outside of the allowed range. Please contact your local Videojet Service Representative. | 1) Defective Sensor.  
2) Defective IMB. |
| E15065          | Mixer Tank Empty              | The Mixer Tank is empty. Please check the Ink Cartridge and fit a suitable replacement if necessary. | 1) Ink Cartridge Empty.  
2) No Ink Cartridge.  
3) Wrong Ink Cartridge.  
4) Expired Ink Cartridge.  
5) Ink Cartridge incorrectly fitted.  
6) Service Module 2 failure (valves).  
7) Bad Level Sensor.  
8) Bad IMB (valve drivers)  
9) Venturi clogged |
| E15066          | Mixer Tank Empty              | The Mixer Tank is empty. Please fit a suitable Ink Cartridge and perform 'Prime Mixer Tank' before restarting the jet. | 1) Ink Cartridge Empty.  
2) No Ink Cartridge.  
3) Wrong Ink Cartridge.  
4) Expired Ink Cartridge.  
5) Ink Cartridge incorrectly fitted.  
6) Service Module 2 failure (valves).  
7) Bad Level Sensor.  
8) Bad IMB (valve drivers)  
9) Venturi clogged |

*Table 9-5: Printer Alarms (continued)*
<table>
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<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E15054          | Mixer Tank Level Sensor Error | The printer has not received a valid response from the Mixer Tank Level Sensor. Please turn the printer off and confirm that the sensor is plugged into the Ink Management PCB. | 1) Level sensor unplugged.  
                     |                              |                                                                                  | 2) Level sensor miswired.  
                     |                              |                                                                                  | 3) Bad level sensor connector.  
                     |                              |                                                                                  | 4) Make-up Tank sensor installed in place of Mixer Tank sensor.  
                     |                              |                                                                                  | 5) Mixer Tank sensor addressed incorrectly.  
                     |                              |                                                                                  | 6) Sensor failure.  
                     |                              |                                                                                  | 7) Bad IMB                                                            |
| E15063          | Mixer Tank High             | The level of fluid in the Mixer Tank is above the allowed limit. Please continue to run the Ink Jet if possible and avoid actions that will result in the introduction of additional Make-up into the system, including Clean Stop/Start and Nozzle Flushing. | 1) High level in tank due to excessive starts and stops, or excessive nozzle flushing.  
                     |                              |                                                                                  | 2) Foaming in Mixer Tank.  
                     |                              |                                                                                  | 3) Defective Level Sensor.  |
| E15064          | Mixer Tank Low              | The level of fluid in the Mixer Tank is below the allowed limit. Please check the Ink Cartridge and fit a suitable replacement if necessary. | 1) Ink Cartridge Empty.  
                     |                              |                                                                                  | 2) No Ink Cartridge.  
                     |                              |                                                                                  | 3) Wrong Ink Cartridge.  
                     |                              |                                                                                  | 4) Expired Ink Cartridge.  
                     |                              |                                                                                  | 5) Ink Cartridge incorrectly fitted.  
                     |                              |                                                                                  | 6) Service Module 2 failure (valves).  
                     |                              |                                                                                  | 7) Bad Level Sensor.  
                     |                              |                                                                                  | 8) Bad IMB (valve drivers)  
                     |                              |                                                                                  | 9) Venturi clogged. |
| E15040          | Mixer Tank Not Filling      | The Mixer Tank has failed to fill in the allowed time. Please check the Ink Cartridge and fit a suitable replacement Cartridge if necessary. | 1) Ink cartridge physically empty but ok per Smart Chip.  
                     |                              |                                                                                  | 2) Service Module 2 failure (valves) (Check if plugged in; run Hardware Test to confirm faulty component and replace).  
                     |                              |                                                                                  | 3) Failed level sensor (Replace Ink System).  
                     |                              |                                                                                  | 4) Failed IMB (Valve driver circuits).  
                     |                              |                                                                                  | 5) Venturi clogged. |

Table 9-5: Printer Alarms (continued)
## Troubleshooting

<table>
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<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E15353          | Mixer Tank Level Sensor Out of Range | The Mixer Tank Level Sensor is reporting a value outside of the allowed range. Please contact your local Videojet Service Representative. | 1) Defective Sensor.  
2) Defective IMB. |
| E10649          | New Ink Parameters         | The Ink operating parameters have changed and updated to IMB.                    |                                            |
| E15561          | No Code No Run             | The printer has stopped printing, because it has missed a number of prints, equal to the No Code No Run Threshold setting. Please review any 'Missed Print' warnings displayed and adjust the printer setup or No Code No Run Threshold accordingly. |                                            |
| E15258          | Raster Manager Parameters Missing | The Raster Manager failed to update with the required parameters. Please cycle power to reprogram the Raster Manager. | 1) Anomaly during power-on.  
2) Anomaly during software upgrade procedure.  
3) Bad software build |
| E15257          | No Raster Files Found      | The printer's memory is void of Raster files and therefore printing is not possible. Please contact your local Videojet Service Representative. | 1) Anomaly during software upgrade procedure.  
2) Rogue version (SAR) containing excess or incorrectly named files was loaded. |
| E15261          | Incompatible Raster File Detected | The Printer has identified an incompatible Raster file within its memory. Please contact your local Videojet Service Representative. | Bad file in software build |

*Table 9-5: Printer Alarms (continued)*
<table>
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<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15152</td>
<td>Unable To Control Viscosity</td>
<td>The Printer has been unable to recover from an incorrect Ink Viscosity condition within the allowed time. Perform a Hardware test to check the Ink System components. Then, restart the Ink Jet to allow for additional Viscosity correction.</td>
<td>See root causes for E15150 and E15151.</td>
</tr>
<tr>
<td>E15559</td>
<td>Print Module Not Fitted or Invalid</td>
<td>The printer cannot detect the presence of the Print Module. Please confirm Print Module is inserted. Please contact your local Videojet Service Representative.</td>
<td></td>
</tr>
<tr>
<td>E15085</td>
<td>Preview Image Corrupted</td>
<td>The Preview Image failed to load. The default Image has been used.</td>
<td></td>
</tr>
<tr>
<td>E15390</td>
<td>Main Control Board +15 VDC Power Supply Error</td>
<td>The Main Control Board +15 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down voltage. 2) Defective Mains Power Supply. 3) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15391</td>
<td>Main Control Board +1.1 VDC Power Supply Error</td>
<td>The Main Control Board +1.1 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>Defective Main Control Board</td>
</tr>
<tr>
<td>E15389</td>
<td>Main Control Board +24 VDC Power Supply Error</td>
<td>The Main Control Board +24 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down voltage. 2) Defective Mains Power Supply. 3) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15392</td>
<td>Main Control Board +2.5 VDC Power Supply Error</td>
<td>The Main Control Board +2.5 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>Defective Main Control Board</td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
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<table>
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<tr>
<th>Error Reference</th>
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<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15394</td>
<td>Main Control Board +3.15 VDC Power Supply Error</td>
<td>The Main Control Board +3.15 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>Defective Main Control Board</td>
</tr>
<tr>
<td>E15395</td>
<td>Main Control Board +3.3 VDC Power Supply Error</td>
<td>The Main Control Board +3.3 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down voltage. 2) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15397</td>
<td>Main Control Board +4.2 VDC Power Supply Error</td>
<td>The Main Control Board +4.2 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>Defective Main Control Board</td>
</tr>
<tr>
<td>E15396</td>
<td>Main Control Board +5 VDC Power Supply Error</td>
<td>The Main Control Board +5 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative.</td>
<td>1) External load is pulling down voltage. 2) Defective Mains Power Supply. 3) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15067</td>
<td>Ink System Connection Lost</td>
<td>The Main Control Board has lost communication with the Ink Management PCB. Turn the printer OFF and check the cable connection between the Main Control Board and the Ink System.</td>
<td>1) Faulty connection between the IMB and the Main Control Board. 2) Defective IMB (loss of +24VDC power to IMB, or faulty load is pulling down +24VDC on the IMB. Note that loss of communications impairs the IMB's ability to report a power supply problem). 3) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15068</td>
<td>Ink System Connection Error</td>
<td>The Main Control Board has bad communication with the IMB. Turn the printer OFF and check the cable connection between the Main Control Board and the Ink Management Board.</td>
<td></td>
</tr>
<tr>
<td>Error Reference</td>
<td>Name</td>
<td>Remedial Action</td>
<td>Cause</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| E15393          | Main Control Board -15 VDC Power Supply Error | The Main Control Board -15 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative. | 1) External load is pulling down voltage.  
2) Defective Mains Power Supply.  
3) Defective Main Control Board. |
| E15443          | Main Control Board VCORE Out of Range | The Main Control Board VCORE (+1.4 VDC) is outside of the allowed tolerance. Please contact your local Videojet Service Representative. | Defective Main Control Board |
| E15529          | Main Control Board VMON is Out of Range | The Main Control Board VMON is outside of the allowed tolerance. Please contact your local Videojet Service Representative. | Defective Main Control Board |
| E15444          | Main Control Board VREF +2 VDC Out of Range | The Main Control Board VREF +2 VDC is outside of the allowed tolerance. Please contact your local Videojet Service Representative. | Defective Main Control Board |
| E10638          | Printhead Missing Data              | The Printhead Data cannot be found and no valid backup exists. Please contact your local Videojet Service Representative. | Defective Main Control Board |
| E15563          | Job Queue Overload                 | Print Job Queue Overload. Please contact your local Videojet Service Representative. | Defective Main Control Board |
| E15263          | 'Quick' Start due to No Make-up Cartridge | The printer is performing a 'Quick' Start as there is No Make-up Cartridge. | See E15557 |
| E15264          | 'Quick' Start as Make-up Cartridge Empty | The printer is performing a 'Quick' Start as the Make-up Cartridge is Empty. | See E15050 |
| E15262          | 'Quick' Start as Mixer Tank High    | The printer is performing a 'Quick' Start as the Mixer Tank is High. | See E15063 |

Table 9-5: Printer Alarms (continued)
## Troubleshooting

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15266</td>
<td>'Quick' Stop due to Incorrect Make-up Type</td>
<td>The printer performed a 'Quick' Stop due to incorrect Make-up Type. To avoid start-up issues, restart the Ink Jet at the earliest opportunity. Inspect the Printhead prior to start and clean if necessary.</td>
<td>See E15285</td>
</tr>
<tr>
<td>E15267</td>
<td>'Quick' Stop due to No Make-up Cartridge</td>
<td>The printer performed a 'Quick' Stop as there is No Make-up Cartridge. To avoid start-up issues, restart the Ink Jet at the earliest opportunity. Inspect the Printhead prior to start and clean if necessary.</td>
<td>See E15557</td>
</tr>
<tr>
<td>E15268</td>
<td>'Quick' Stop as Make-up Cartridge Empty</td>
<td>The printer performed a 'Quick' Stop as the Make-up Cartridge is Empty. To avoid start-up issues, restart the Ink Jet at the earliest opportunity. Inspect the Printhead prior to start and clean if necessary.</td>
<td>See E15050</td>
</tr>
<tr>
<td>E15265</td>
<td>'Quick' Stop as Mixer Tank High</td>
<td>The printer performed a 'Quick' Stop as the Mixer Tank is High. To avoid start-up issues, restart the Ink Jet at the earliest opportunity. Inspect the Printhead prior to start and clean if necessary.</td>
<td>See E15063</td>
</tr>
<tr>
<td>E15256</td>
<td>Raster Family File Size Too Large</td>
<td>The number of Raster Files exceeds the maximum allowed by the system. Please contact your local Videojet Service Representative.</td>
<td>Extra file(s) in build</td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15255</td>
<td>Raster Pixel Span Problem</td>
<td>The printer has identified a faulty Raster File within its memory. Please contact your local Videojet Service Representative.</td>
<td>Bad file in software build</td>
</tr>
<tr>
<td>E15253</td>
<td>Too Many Raster Files Found</td>
<td>The number of Raster Files exceeds the maximum allowed by the system. Please contact your local Videojet Service representative.</td>
<td>1) Anomaly during software upgrade procedure. 2) Anomaly during back-up / restore. 3) Rogue version / SAR version containing excess or incorrectly named files was loaded.</td>
</tr>
<tr>
<td>E15462</td>
<td>Humidity Sensor Reading is Invalid</td>
<td>The Humidity reading supplied to the Ink Management PCB microcontroller is not valid. Please contact your local Videojet Service Representative if the warning persists.</td>
<td>1) Communications glitch. 2) Mismatch between hardware and software/firmware. 3) Excessive electrical / electronic noise in vicinity of printer. 4) Another i2C device on the IMB bus is generating noise. 5) Grounding problem. 6) Erratic 3.3 VDC power on Ink Management PCB. 7) Defective Ink Management Board</td>
</tr>
<tr>
<td>E15574</td>
<td>Service Module 2 Not Fitted or Invalid</td>
<td>A valid Service Module 2 cannot be detected by the printer. Please install a suitable Service Module 2.</td>
<td>1) Service Module 2 is missing. 2) Service Module 2 is not fitted correctly. 3) Service Module 2 Smart Chip is not programmed. 4) Faulty connection between the Ink Management PCB and the Service Module 2. 5) Defective Service Module 2. 6) Defective Ink Management PCB.</td>
</tr>
<tr>
<td>E15531</td>
<td>Service Module 2 Replacement Required</td>
<td>The Service Module 2 has reached the end of its usable life. Please replace the Service Module 2.</td>
<td>1) Run hours consumed. 2) Service Module 2 Smart Chip was not programmed correctly. 3) Unrelated event caused Service Module 2 Smart Chip run hours to increment.</td>
</tr>
</tbody>
</table>

*Table 9-5: Printer Alarms (continued)*
## Troubleshooting

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15803</td>
<td>Service Module 2 Replacement Due in %L1 Hours</td>
<td>The Service Module 2 is nearing the end of its life. Please ensure that you have a replacement available.</td>
<td></td>
</tr>
<tr>
<td>E15805</td>
<td>Traversing Unavailable</td>
<td>Traversing is unavailable on a printer without the Expansion board. Product direction is set to &quot;Right to Left&quot;.</td>
<td></td>
</tr>
<tr>
<td>E10671</td>
<td>Ink System Valve Current Offset Out of Range</td>
<td>The Current Offset measured by the printer at initialization for the Ink System Valves is outside of the allowed tolerance. Please cycle power to reset the Current Offset.</td>
<td>1) Erroneous offset value calculated by the printer at boot-up. 2) Environmental extreme is affecting circuit sensitivity 3) Mismatch between software and hardware - the 'offset' limitation is not appropriate for the hardware in use. 4) Short circuit in one or more valves (run hardware self-test or valve test) 5) Defective Ink Management PCB</td>
</tr>
<tr>
<td>E10680</td>
<td>Ink System Valve Current Too High</td>
<td>The current measured in the Valve Drive circuit is too high for the number of Valves in use. Stop the Jet and run a Hardware Test to check Valve functionality.</td>
<td>1) Mismatch between software and hardware - the coded current tolerance is not appropriate for the hardware in use. 2) Short circuit in one or more valves (run hardware self-test or valve test) 3) Defective Ink Management PCB</td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E10681          | Ink System Valve Current Too Low          | The Current measured in the Valve Drive circuit is too low for the number of Valves in use. Stop the Jet and run a Hardware Test to check Valve functionality. | 1) Mismatch between software and hardware - the coded current tolerance is not appropriate for the hardware in use.  
2) Environmental extreme, or excessive cycling of valves has affected circuit sensitivity or valve resistivity.  
3) Open circuit in one or more valves (should be reported as soon as jet is stopped and valve is shut; run hardware self-test or valve test)  
4) Defective Ink Management PCB |
| E15699          | Ink System Valve Driver 1 Power Supply Warning | The supply voltage to the Ink System valve driver chip is outside of the allowed tolerance. Please turn the printer OFF and check the connection between the Main Control Board and the Ink Management PCB. | 1) External load is pulling down +24 VDC on the IMB.  
2) Defective IMB.  
3) Defective Mains Power Supply.  
4) Defective connection between the MCB and the IMB.  
5) Defective Main Control Board. |
| E15700          | Ink System Valve Driver 1 Thermal Warning  | The Ink System valve driver chip has overheated. Please stop the Jet and refrain from operating the printer until the condition has cleared. | 1) Excessive valve operation (scratchpad, flush kit etc.).  
2) Printer operation in extreme ambient conditions.  
3) Short circuit in valve(s).  
4) Defective U81 (replace IMB). |

*Table 9-5: Printer Alarms (continued)*
## Troubleshooting

### Table 9-5: Printer Alarms (continued)

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15701</td>
<td>Ink System Valve Driver 2 Power Supply Warning</td>
<td>The supply voltage to the Ink System valve driver chip is outside of the allowed tolerance. Please turn the printer OFF and check the connection between the Main Control Board and the Ink Management PCB.</td>
<td>1) External load is pulling down +24 VDC on the IMB. 2) Defective IMB. 3) Defective Mains Power Supply. 4) Defective connection between the MCB and the IMB. 5) Defective Main Control Board.</td>
</tr>
<tr>
<td>E15702</td>
<td>Ink System Valve Driver 2 Thermal Warning</td>
<td>The Ink System valve driver chip has overheated. Please stop the Jet and refrain from operating the printer until the condition has cleared.</td>
<td>1) Excessive valve operation (scratchpad, flush kit etc.). 2) Printer operation in extreme ambient conditions. 3) Short circuit in valve(s). 4) Defective U14 (replace IMB).</td>
</tr>
<tr>
<td>E15695</td>
<td>Valve VD is an Open Circuit.</td>
<td>The Printer failed to confirm that Valve VD is properly connected to the printer's electrical system. Ensure that the valve assembly is properly connected.</td>
<td></td>
</tr>
<tr>
<td>E15696</td>
<td>Valve VD is a Short Circuit</td>
<td>Excessive current was detected when attempting to operate Valve VD. Please check the integrity of the valve assembly connector.</td>
<td></td>
</tr>
<tr>
<td>E15689</td>
<td>Valve VE is an Open Circuit.</td>
<td>The Ink Management PCB failed to confirm that Valve VE is properly connected to the printer's electrical system. Ensure that the valve assembly is properly connected to the Ink Management PCB.</td>
<td>1) Valve assembly is unplugged, or the connector is not properly fitted to the IMB. 2) Valve failure (replace Valve Assembly). 3) Defective Ink Management PCB (U14, trace, or component failure).</td>
</tr>
<tr>
<td>Error Reference</td>
<td>Name</td>
<td>Remedial Action</td>
<td>Cause</td>
</tr>
<tr>
<td>-----------------</td>
<td>------</td>
<td>----------------</td>
<td>-------</td>
</tr>
<tr>
<td>E15690</td>
<td>Valve VE is a Short Circuit.</td>
<td>Excessive current was detected when attempting to operate Valve VE. Please check the integrity of the valve assembly connector.</td>
<td>1) Short circuit caused by foreign substance on Ink Management PCB. 2) Defective valve or defective valve assembly wire harness (replace valve assembly). 3) Defective Ink Management PCB.</td>
</tr>
<tr>
<td>E15683</td>
<td>Valve VI is an Open Circuit.</td>
<td>The Ink Management PCB failed to confirm that Valve VI is properly connected to the printer’s electrical system. Ensure that the Service Module 2 is properly fitted.</td>
<td>1) Service Module 2 is removed, or is not properly fitted. 2) Ribbon cable between Ink Management PCB and Service Module 2 is not properly fitted. 3) Valve failure (replace Service Module 2). 4) Defective Ink Management PCB (U81, trace, or component failure).</td>
</tr>
<tr>
<td>E15684</td>
<td>Valve VI is a Short Circuit.</td>
<td>Excessive current was detected when attempting to operate Valve VI. Check for ink leakage in the vicinity of the Service Module 2’s electrical interface.</td>
<td>1) Short circuit caused by foreign substance (ink) at Service Module 2 electrical interface. 2) Short circuit caused by foreign substance on Ink Management PCB. 3) Defective ribbon cable between Ink Management PCB and Service Module 2. 4) Valve Failure (replace Service Module 2). 5) Defective Ink Management PCB.</td>
</tr>
<tr>
<td>E15679</td>
<td>Valve VJ is an Open Circuit.</td>
<td>The Ink Management PCB failed to confirm that Valve VJ is properly connected to the printer’s electrical system. Ensure that the Service Module 2 is properly fitted.</td>
<td>1) Service Module 2 is removed, or is not properly fitted. 2) Ribbon cable between Ink Management PCB and Service Module 2 is not properly fitted. 3) Valve failure (replace Service Module 2). 4) Defective Ink Management PCB (U81, trace, or component failure).</td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
</table>
| E15680          | Valve VJ is a Short Circuit | Excessive current was detected when attempting to operate Valve VJ. Check for ink leakage in the vicinity of the Service Module 2's electrical interface. | 1) Short circuit caused by foreign substance (ink) at Service Module 2 electrical interface.  
2) Short circuit caused by foreign substance on Ink Management PCB.  
3) Defective ribbon cable between Ink Management PCB and Service Module 2 (VJ hit and hold is on Pin 3 of the 26-way ribbon cable, the return to the valve current monitor is on Pin 2).  
4) Valve Failure (replace Service Module 2).  
5) Defective Ink Management PCB. |
| E15697          | Valve VK is an Open Circuit | The Ink Management PCB failed to confirm that Valve VK is properly connected to the printer's electrical system. Ensure that the Service Module 2 is properly fitted. | 1) Service Module 2 is removed, or is not properly fitted.  
2) Ribbon cable between Ink Management PCB and Service Module 2 is not properly fitted.  
3) Valve failure (replace Service Module 2).  
4) Defective Ink Management PCB (U14, trace, or component failure). |
| E15698          | Valve VK is a Short Circuit | Excessive current was detected when attempting to operate Valve VK. Check for ink leakage in the vicinity of the Service Module 2's electrical interface. | 1) Short circuit caused by foreign substance (ink) at Service Module 2 electrical interface.  
2) Short circuit caused by foreign substance on Ink Management PCB.  
3) Defective ribbon cable between Ink Management PCB and Service Module 2 (VK is on pin 16 of the 26-way ribbon cable, Ground is on pin 15).  
4) Valve Failure (replace Service Module 2).  
5) Defective Ink Management PCB. |

Table 9-5: Printer Alarms (continued)
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15681</td>
<td>Valve VR is an Open Circuit.</td>
<td>The Ink Management PCB failed to confirm that Valve VR is properly connected to the printer's electrical system. Ensure that the Service Module 2 is properly fitted.</td>
<td>1) Short circuit caused by foreign substance (ink) at Service Module 2 electrical interface.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Short circuit caused by foreign substance on Ink Management PCB.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Defective ribbon cable between Ink Management PCB and Service Module 2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4) Valve Failure (replace Service Module 2).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5) Defective Ink Management PCB.</td>
</tr>
<tr>
<td>E15682</td>
<td>Valve VR is a Short Circuit.</td>
<td>Excessive current was detected when attempting to operate Valve VR. Check for ink leakage in the vicinity of the Service Module 2's electrical interface.</td>
<td>1) Short circuit caused by foreign substance (ink) at Service Module 2 electrical interface.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Short circuit caused by foreign substance on Ink Management PCB.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Defective ribbon cable between Ink Management PCB and Service Module 2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4) Valve Failure (replace Service Module 2).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5) Defective Ink Management PCB.</td>
</tr>
<tr>
<td>E15687</td>
<td>Valve VV is an Open Circuit.</td>
<td>The Ink Management PCB failed to confirm that Valve VV is properly connected to the printer's electrical system. Ensure that the valve assembly is properly connected to the Ink Management PCB.</td>
<td>1) Valve assembly is unplugged, or the connector is not properly fitted to the IMB.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Valve failure (replace Valve Assembly).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Defective Ink Management PCB (U14, trace, or component failure).</td>
</tr>
</tbody>
</table>

*Table 9-5: Printer Alarms (continued)*
## Troubleshooting

<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15688</td>
<td>Valve VV is a Short Circuit.</td>
<td>Excessive current was detected when attempting to operate Valve VV. Please check the integrity of the valve assembly connector.</td>
<td>1) Short circuit caused by foreign substance on Ink Management PCB.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Defective valve or defective valve assembly wire harness (replace valve assembly).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Defective Ink Management PCB.</td>
</tr>
<tr>
<td>E15008</td>
<td>Viscometer Empty Time Too Long</td>
<td>The Viscometer failed to empty within the allotted time and therefore the printer is incapable of viscosity monitoring. Please contact your local Videojet Service Representative.</td>
<td>1) Viscometer drain is clogged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Ink is thick.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Mixer tank vent cross-connect is blocked.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4) Valve VV leaking by.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5) 'Low' level probe is malfunctioning (shorted to ground).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6) Defective IMB.</td>
</tr>
<tr>
<td>E15007</td>
<td>Viscometer Fill Time Too Long</td>
<td>The Viscometer failed to fill within the allotted time and therefore the printer is incapable of viscosity monitoring. Run a Hardware Self Test to check ink system components.</td>
<td>1) VMS Restrictor is clogged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) 'High' level probe is malfunctioning (not connected).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Valve VV malfunction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4) Defective IMB (Level probe or Valve Drive circuit).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5) Viscometer overflow is blocked (no vent path).</td>
</tr>
<tr>
<td>E15006</td>
<td>Viscometer Fault</td>
<td>The Viscometer was not completely empty at the beginning of the printer's viscosity control cycle. Please contact your local Videojet Service Representative.</td>
<td>1) Viscometer not empty.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) 'High' or 'low' probe shorted to ground.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Defective Ink Management PCB.</td>
</tr>
<tr>
<td>E15592</td>
<td>Viscometer Temperature Sensor Communications Error</td>
<td>The Ink Management PCB is unable to communicate with the Viscometer Temperature Sensor. Please contact your local Videojet Service representative.</td>
<td></td>
</tr>
</tbody>
</table>

*Table 9-5: Printer Alarms (continued)*
<table>
<thead>
<tr>
<th>Error Reference</th>
<th>Name</th>
<th>Remedial Action</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15466</td>
<td>Viscometer Temperature Sensor is an Open Circuit</td>
<td>The Ink Management PCB is not receiving a valid signal from the Viscometer Temperature Sensor. Turn the printer OFF and check the connection between the Viscometer Temperature Sensor and the Ink Management PCB.</td>
<td>1) Sensor is not plugged in. 2) Defective sensor (replace viscometer). 3) Defective IMB.</td>
</tr>
<tr>
<td>E15465</td>
<td>Viscometer Temperature Sensor Supply Voltage Too Low</td>
<td>The supply voltage to the Viscometer Temperature Sensor circuit is below the minimum allowed value. Please contact your local Videojet Service Representative.</td>
<td>1) Defective Ink Management PCB. 2) Faulty component in the ink system is pulling down the local +3.3 VDC supply.</td>
</tr>
<tr>
<td>E10670</td>
<td>Viscometer Temperature Feedback Error</td>
<td>The Ambient and Viscometer Temperatures do not agree. Turn the printer OFF and check the connection between the Viscometer Temperature Sensor and the Ink Management PCB.</td>
<td></td>
</tr>
<tr>
<td>E15445</td>
<td>Warming Up</td>
<td>Please wait while the Ink System warms up.</td>
<td>1) 'Cold' start-up. 2) Printer is operating in an environment outside of the prescribed limits. 3) Cold ambient and ink compartment door is open. 4) Defective viscometer temperature sensor.</td>
</tr>
<tr>
<td>E15044</td>
<td>Invalid Job Width</td>
<td>The Job exceeds the maximum Print Width. Please edit the Job to reduce the Print Width before continuing or select a new Job.</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-5: Printer Alarms (continued)
9.5 Voltage Checks

Table 9-6 is a representation of the power connector with the voltages shown for each pin. Use Pin 2 as the 0 V reference.

Note: Allow ± 5% tolerance on all voltages. The power connector must be connected to the MCB to carry out this check.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Connector</th>
<th>MCB</th>
</tr>
</thead>
<tbody>
<tr>
<td>+15V</td>
<td>PIN 1</td>
<td>TPL31</td>
</tr>
<tr>
<td>-15V</td>
<td>PIN 4</td>
<td>TPL32</td>
</tr>
<tr>
<td>+5V</td>
<td>PIN 3 &amp; 5</td>
<td>TPL29</td>
</tr>
<tr>
<td>+24V</td>
<td>PIN 6</td>
<td>TPL30</td>
</tr>
<tr>
<td>GND</td>
<td>PIN 2 &amp; 7</td>
<td>TPL53, TPL54, TPL55</td>
</tr>
<tr>
<td>No connect</td>
<td>Pin 8</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-6: MCB Power Connector Voltage Check
9.6 Jet Start and Stop Diagnostics

Use the following flow charts to diagnose problems that occur because of dirty inkjet starts and stops.

**Quick Start Diagnostics**

![Quick Start Diagnostics Flowchart]

*Figure 9-4: Quick Start Diagnostics Flowchart*
Troubleshooting

1. Ensure that the printer has been shut down with a clean stop.
2. Place a clean piece of paper under the printhead.
3. Carry out a clean start.
5. Is the break-up symmetrical now? Yes: Carry out a nozzle clean. No: Is the break-up symmetrical? Yes: Is the break-up symmetrical now? No: Change the nozzle.
6. Was the printer shut down with a clean stop? Yes: Clean the make-up valve in the PH. No: Carry out a clean stop.
7. Replace the PH valve module.

Sheet 1
Figure 9-5: Quick Start Diagnostics Flowchart
Troubleshooting

Quick Stop Diagnostics

Start

- Ensure that the jet is in the correct position in the gutter

Place a piece of paper under the printhead

Initiate the clean stop

- Does the ink remain in the gutter during the transition from ink to make-up? No

- Run system flush purge

- Is the ink visible in the flushing circuit? No

- Is the break up of the jet symmetrical? No

- Backflush the nozzle to remove debris

- Is the break up of the jet symmetrical now? Yes

- Carry out a nozzle clean

- Can solvent be seen exiting from the nozzle? No

- Is the flush pump working and pumping solvent? No

- Move the jet position further back into the gutter

- Can all the lines be printed over the entire EHT range? No

- Change the PH valve module

- Is mark on the paper within the acceptance criteria? Yes

- Yes

- No

- Yes

- No

Clean stop pass

Figure 9-6: Quick Stop Diagnostics
9.7 **How to Clear a Clogged Nozzle**

A blockage in the nozzle may be present if the print module is showing signs of a misaligned ink stream/loss of ink stream. To clear the blockage in the nozzle, please follow the procedures described below:

1. Perform two Nozzle Backflush operations (Tools > Maintenance > Nozzle Backflush). Refer to Perform a Nozzle Backflush for more information.

2. If needed, perform a Nozzle Clean operation (Tools > Maintenance > Nozzle Clean). Refer to Perform a Nozzle Clean for more information.

**9.7.1 Perform a Nozzle Backflush**

Do the following tasks to perform Nozzle Backflush:

1. Place the printer in SHUTDOWN mode.
2. Remove the printhead cover screw that fastens the printhead cover to the printhead chassis and remove the printhead cover.
3. Place the printhead into the wash station with a properly earthed bowl underneath to collect any extra solvent.
4. Make sure the container is connected to the electrical ground.
5. Make sure to have the correct cleaning solution on the hand.
6. Touch the Start button (Figure 9-7) to start the Nozzle Backflush. During the sequence, spray the cleaning solution into the charge electrode slot in short bursts.

7. After it is completed, clean the print module using the correct cleaning solution until any ink build-up is removed.

8. Repeat Step 6 and Step 7 and continue to Step 9.

9. Let the nozzle dry completely.

*Figure 9-7: Nozzle Backflush*
Troubleshooting

10. Remove the Printhead from the wash station and replace the printhead cover on the printhead chassis and secure it with the help of the printhead cover screw.

11. Remove the bowl and discard the contents according to local regulations.

12. Perform a test print to check if the nozzle is clean.

9.7.2 Perform a Nozzle Clean

If the jet remains out of alignment, do the following tasks to perform Nozzle Clean:

1. Place the printer in SHUTDOWN mode.

2. Remove the printhead cover screw that fastens the printhead cover to the printhead chassis and remove the printhead cover.

3. Place the printhead into the Wash Station with a properly earthed bowl underneath to collect any extra solvent.

4. Make sure the container is connected to the electrical ground.

5. Touch the Start button (Figure 9-8) to start the Nozzle Clean.

6. After it is completed, clean the print module using the correct cleaning solution until any ink build-up is removed.

7. Let the nozzle dry completely.

8. Remove the printhead from the Wash Station and replace the printhead cover on the printhead chassis and secure it with the help of the printhead cover screw.

9. Remove the bowl and discard the contents according to local regulations.

10. Perform a test print to check if the nozzle is clean.
9.8 How to Correct Loss of Modulation

Do the following tasks if a print module indicates loss of modulation:

*Note: Ensure that the auto modulation is enabled (Tools > Printer Settings > Printhead Control).*

1. Perform a Nozzle Clean operation (Tools > Maintenance > Nozzle Clean). Refer Perform a Nozzle Clean for more information.

2. If needed, perform a Quick Start operation (Tools > Printer Settings > Printer Control > Jet Start and Stop Mode and select Quick).

3. Use a magnifying loupe to inspect the ink stream for drop formation. You must perform this task to make sure that the nozzle creates the droplets.

4. If the ink stream remains solid, check the modulation wire on the print module to make sure that it is not damaged and is correctly connected.

5. If you see a broken modulation wire, contact Videojet Technologies Inc. to change the print module.

6. If the modulation wire is not broken, use an oscilloscope to measure the MOD Voltage on test point TPL26 on the MCB to make sure that the on-board power supplies the modulation voltage.

7. Another possible cause of a loss of modulation is a bad connection under the print module itself.
   a. Turn off the printer.
   b. Remove the print module and test for continuity between the MCB and the printhead circuit.
   c. If the continuity is good, install again the print module.
   d. Restart the printer.

*Note: The user can set the modulation voltage to the required value based on Last Known Good Modulation voltage available for reference*
Appendix A Clean/Quick Start and Stop Description

Introduction

This chapter provides the printer specifications and contains the following topics:

- Clean Start/Stop Standards
- Clean Start
- Quick Start
- Clean Stop
- Quick Stop
- Nozzle Backflush

A.1 Clean Start/Stop Standards

The following illustrations show the minimum acceptable standards for clean start and clean stop. Compare these samples obtained by placing a sheet of blank paper directly under the printhead.

![Typical clean start/stop](samples are shown actual size)

![Typical dirty start/stop]

![Minimum standard required]

Figure A-9: Clean Start/Stop Test Illustrations
A.2 Clean Start

The Clean Start sequence is as follows:
1. Prepares the printer to start
2. Checks the valve operation
3. Cleans the Nozzle
4. Starts the solvent pump
5. Starts the Ink Jet
6. Waits for head to stabilize.

A.3 Quick Start

This method starts without cleaning sequence, and uses the ink supply to bleed the air from the nozzle.

A.4 Clean Stop

The Clean Stop sequence is as follows:
1. Disable jet control operations
2. Starts the solvent pump
3. Stops the ink pump
4. Cleans the nozzle
5. Prepares and stops the ink system.

A.5 Quick Stop

Note: This sequence is used to manually stop the jet for a short period, or to automatically stop the jet during instances like EHT trip and charge error.

This method switches off the ink without flushing the nozzle or manifold. Hence, the manifold and the nozzle are full of ink when the jet stops. The machine must not be left in this state for long periods, as dry ink in the jet orifice may make restarting difficult. This procedure is primarily intended for situations where the machine may be stopped and restarted several times in quick succession. Under these conditions, the use of solvent may become excessive and cause dilution of the ink.

A.6 Nozzle Backflush

When nozzle Backflush is selected, solvent is applied to the nozzle and gutter to clear any blockage.

Nozzle Backflush completes automatically, but can be stopped at any time before that by powering off the printer.
Introduction

This chapter provides the encoder information and contains the following topics:

- Manual Setup (Internal Encoding)
- Measured by Shaft Encoder (External Encoding)
- Measured by Product Size/Time (Auto Encoding)

B.1 Manual Setup (Internal Encoding)

Internal Encoding is used when product speed is constant. An internal clock sets the stroke-rate to a constant pace.

Internal Encoding is used when the product speed is constant. The internal clock of the printer is set to the speed of the product in feet per minute (FPM) or meters per minute (MPM).

To use Internal Encoding, it is necessary to determine the product speed. This section describes four methods that can be used to determine the product speed.

**Method 1**

Use a handheld tachometer that is calibrated to measure linear surface speed in FPM or measure the Revolutions Per Minute (RPM) of the pulley. Convert RPM to surface speed by using the following formula:

\[
\text{Surface speed (FPM)} = \frac{\pi d \times \text{RPM}}{12}
\]

where \( \pi = 3.14 \) and \( d \) = pulley diameter in inches.

**Method 2**

Establish a reference mark on the conveyor belt and measure how many inches (one inch equals 25.4 mm) this mark moves in 5 seconds. This number is equal to the conveyor speed in FPM.

**Method 3**

If you know the number of products produced per minute on the line, the size of the product, and the gap between each product, you can calculate the product speed.

For example:

1200 products per minute are produced on the line, each product is 2.5 inches wide, and there is a one inch gap between each product.

\[
\text{Conveyor speed} = \frac{\left[(\text{products per minute}) \times (\text{size} + \text{gap})\right]}{12}
\]

where size and gap are in inches.

**Method 4**

It is also possible to use the printer’s product counter to determine the number of products per minute, and then calculate the line speed as described in “Method 3”.
B.2 Measured by Shaft Encoder (External Encoding)

External Encoding is used when the speed of the conveyor varies. A shaft encoder measures the conveyor speed, and transmits the data to the printer. This data enables the printer to vary the stroke rate according to the variation in the speed of the conveyor. You can use the following types of shaft encoding methods:

- A direct shaft encoder maintains a 1:1 ratio between the encoder pulses and print strokes.
- Non-quad - Uses both the channels from encoder A and B. The leading and trailing edges of the channels give four times the number of pulses delivered from the encoder.
- Rollback Compensation or Backlash Protection - If the product is placed on a line that can move or settle (for example, conveyor belt) and it stops, rollback compensation makes sure that the printer prints on that product one time only. In this feature either A leads B or B leads A. This provides the printer with rollback compensation. The printer counts the number of encoder counter strokes as it prints. If the line stops and moves backwards, the printer will not restart printing until the counter stroke number has returned to the last known good position. This feature makes sure that the printer prints one time in the standard direction of line travel and not in the reverse direction of line travel.
- A divided-down shaft encoder is used when the conveyor speed requires fewer pulses than the actual output of the shaft encoder.

\[ d = \text{distance of conveyor (product) travel per revolution of shaft} \]

*Figure B-10: Product Distance*

Required shaft encoder:

Pulses per Revolution (PPR) = \( d \times (\text{strokes per inch}) \)

Where strokes per inch = (strokes per character) \( \times \) (characters per inch)
**Example 1**

1800 PPR Encoder connected to production line.

\[ d = 10 \text{ inches of product travel for one revolution} \]

If you want to print using 5x7 SL matrix and the required print pitch is 10 Characters Per Inch (CPI),

then \( 1800 \text{ PPR} / 10 = 180 \text{ PPI} \), where Encoder (PPR) = 1800 and Wheel Circumference = 10 in.

If both A and B channel are in use,
Encoder Type = Quadrature
Direction = select either A leads B or B leads A

The printer PPI is 720 with a print pitch requirement of 10 CPI. The number of strokes required for a 5x7 SL matrix at 10 CPI is 60.

As the 5x7 SL matrix is based on 10 CPI, you can get the top line speed on printer speed chart.

**Example 2**

1800 PPR Encoder connected to a production line

\[ d = 23 \text{ inches per revolution} \]

\[ \text{PPI} = 1800 / 23 = 78 \text{ PPI}, \] where Encoder (PPR) = 1800 and Wheel circumference = 23 in.

But, as the setting is a non-quad configuration,
Encoder Type = Non-quad

**Example 3**

If the standard 1800 PPR shaft encoder is to be used as shown in Example 1, it will be necessary to provide some type of gearing to supply the required 60 pulses per inch as shown in Figure B-11.

![Figure B-11: External Shaft Encoder](image)

---

*Videojet 1860 Service Manual - Rev AA*
To determine the required gearing, the following method is used.

1800 PPR/1380 PPR = 1.3 or 1:3:1 gear ratio

If the diameter of “a” = 2.0 inches, then the diameter of “b” is 2.6 inches (2.0 inches x 1.3 = 2.6 inches). For one rotation of “a”, 1380 pulses are produced from the 1800 PPR shaft encoder.

If that same 1800 PPR shaft encoder is connected directly to the shaft on the conveyor, the calculation would be as follows:

(1800 pulses per revolution)/(23 inches per revolution) = 78 pulses per inch,
where Encoder (PPR) = 1800 and Wheel Circumference = 23 in.

(78 pulses per inch) / (6 strokes per character) = 13 characters per inch

Since the standard calls for 10 characters per inch (refer to Example 1), the message would be compressed on the product.

Encoder Type = Quadrature
Direction = select either A leads B or B leads A

Figure B-12: External Shaft Encoder - With Pulley
B.3 Measured by Product Size/Time (Auto Encoding)

Auto Encoding is used when the product speed and the conveyor speed are different (product slippage) or when the product is allowed to fall through guides from one level to another. When Auto Encoding is selected, the signal from the product detector is used to determine the product speed, and code the product at a set stroke rate.

The requirements for Auto Encoding are the following:

- A product detector
- The length of the detect area (the amount which the detector senses). This value must be entered into the printer.
- The distance between the printhead and the product detector must be set such that, both the leading and trailing edges of the product are sensed by the product detector before the printer starts printing the message.

![Auto Encoding Diagram]

*Figure B-13: Auto Encoding*
Appendix C  MCB Test Points

Introduction

This chapter provides the MCB information and contains the following topics:

- MCB Test points

C.1  MCB Test points

C.1.1  Test Points Fitted on MCB

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Voltage</th>
<th>Connector</th>
<th>MCB</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+15V</td>
<td>J512 PIN 1</td>
<td>TPL31</td>
<td>Directly from PSU</td>
</tr>
<tr>
<td>2</td>
<td>-15V</td>
<td>J512 PIN 4</td>
<td>TPL32</td>
<td>Directly from PSU</td>
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<tr>
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<td>J512 PIN 3 &amp; 5</td>
<td>TPL29</td>
<td>Filtered 5V from PSU</td>
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</table>

*Table A-7: Test Points Fitted on MCB*
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Voltage</th>
<th>Connector</th>
<th>MCB</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
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<td>+24V</td>
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<td>TPL30</td>
<td>Directly from PSU</td>
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<tr>
<td>5</td>
<td>GND</td>
<td>J512 PIN 2 &amp; 7</td>
<td>TPL53, TPL54, TPL55</td>
<td>Directly from PSU</td>
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<tr>
<td>6</td>
<td>PHEAD1_PH_A_VEL</td>
<td>J514 Pin 2</td>
<td>TPL21</td>
<td>Phase &amp; Velocity signal Head 1</td>
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<tr>
<td>7</td>
<td>CHARGE</td>
<td>J521 PIN 1</td>
<td>TPL24</td>
<td>Charge Voltage for Head 1</td>
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<tr>
<td>8</td>
<td>MOD</td>
<td>J521 PIN 4</td>
<td>TPL26</td>
<td>Modulation voltage Head 1</td>
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<tr>
<td>9</td>
<td>FUSED_5V0</td>
<td>J539 Pin 3</td>
<td>TPL58</td>
<td>5V to display</td>
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<tr>
<td>10</td>
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<td>TPL59</td>
<td>3V3 to display</td>
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<tr>
<td>11</td>
<td>4V2</td>
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<td>TPL52</td>
<td>Main processor PSU Voltage</td>
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<tr>
<td>12</td>
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<td>TPL4</td>
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<td>13</td>
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<td>14</td>
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<tr>
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<td>DDR_1V5</td>
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<tr>
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<tr>
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<td>Main Processor Voltage</td>
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<tr>
<td>21</td>
<td>VDDCORE</td>
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<td>TPL15</td>
<td>Main Processor Voltage</td>
</tr>
<tr>
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<td>VDDSOC</td>
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<td>Main Processor Voltage</td>
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<tr>
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<td>Main Processor Voltage</td>
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<td>Raw FPGA 2V5</td>
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<td>Filtered FPGA 2V5 (VCCA_FPLL)</td>
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<tr>
<td>28</td>
<td>P2V5_F2</td>
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<td>Raw FPGA 1V8</td>
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<tr>
<td>30</td>
<td>+1V1</td>
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<td>Raw FPGA 1V1</td>
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<td>TP_1V1A</td>
<td>Filtered FPGA 1V1 (VCC)</td>
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*Table A-7: Test Points Fitted on MCB (continued)*