



FluidInspectIR®
BENCH PRO

MAN_FI_BENCHPRO 1.3

FluidInspectIR BenchPro – User Guide

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2. Product Overview

2.1 Introduction

The **FluidInspectIR BenchPro** is a flexible, laboratory-grade oil analysis system that can be easily transported between sites and set up in any indoor location with normal ambient conditions. It is designed for trained operators to monitor the condition and degradation of industrial cutting fluids. The system combines infrared spectroscopy (IR), kinematic viscosity measurement, and optical particle counting (OPC) to provide comprehensive oil diagnostics in a single, integrated platform.

2.2 Intended Use

The BenchPro system is designed for use in **indoors environments only** by **trained operators**. It is calibrated exclusively for the specific oils defined in the customer agreement with Spectrolytic, for which corresponding calibration files are supplied.

2.3 Key Capabilities

The system typically captures the following oil parameters or a subset of them depending on the oil:

Parameter	Description
Oxidation	Measures oil oxidation level (abs/cm)
Water Content	Detects water contamination (ppm)
TAN	Total Acid Number (mgKOH/g)
TBN	Total Base Number (mgKOH/g)
Kinematic Viscosity (KV40)	Viscosity at 40°C (cSt)
ISO 4406 Cleanliness	Particle contamination rating (4/6/14 µm)
Particle Count	Concentration per ml for each size class
Temperature	Measured sample temperature (°C)

3. System Components and Specifications

3.1 Physical Description

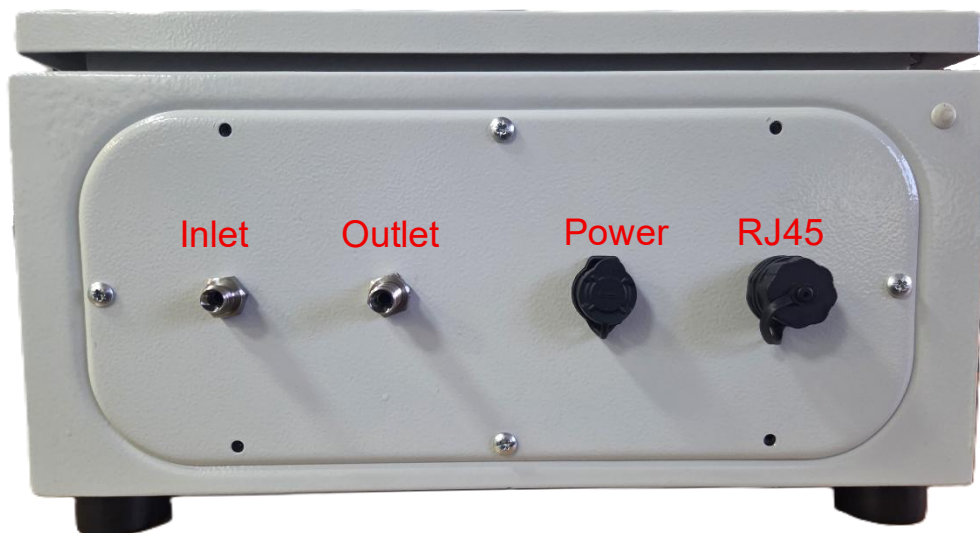


Figure 1A: BenchPro System – Front View

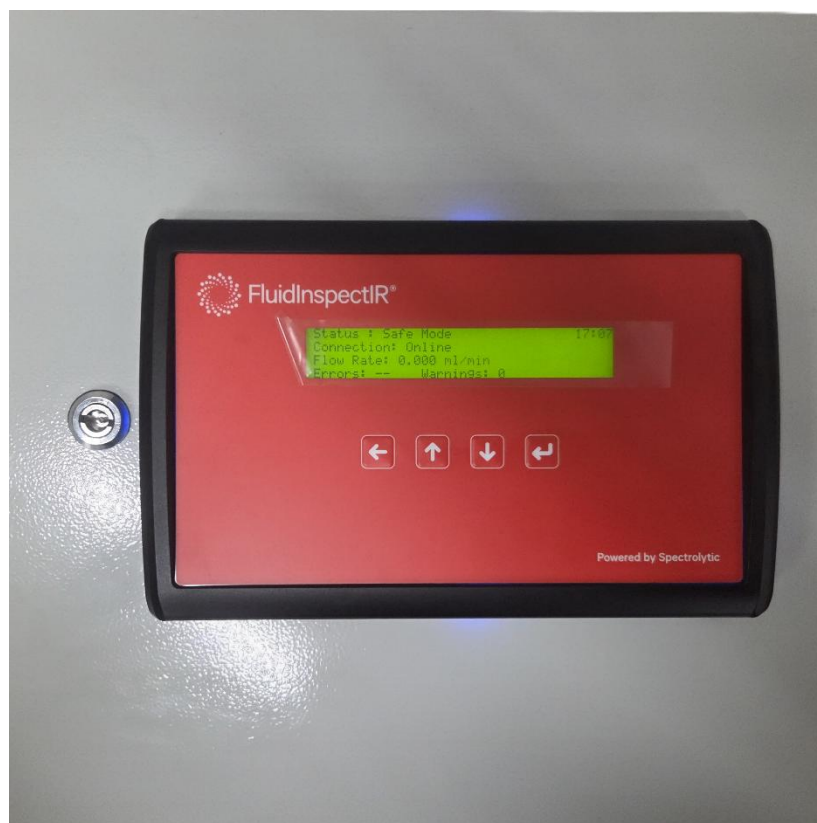


Figure 1B: BenchPro System – Top View

The BenchPro system consists of a compact, sealed analyzer housed in a protective enclosure measuring **250 mm (W) × 430 mm (D) × 400 mm (H)**, weighing approximately **15 kg**. The system includes:

- **Two compression fittings** (front panel): Sample inlet and waste outlet connections
- **Power socket**: AC power input
- **Ethernet port**: Network connectivity for data transfer and device communication

The top panel features an integrated display and control interface.

3.2 Included Accessories

The BenchPro system is supplied with the following components:

Component	Description
AC Power Cord	Standard AC power cable for mains connection
Hoses (qty. 2)	1/4 inch OD (~6.35 mm), 1/8 inch ID (~3.18 mm), ~350 mm length
Ethernet Cable	Network connectivity
Bottle Cap Assembly (qty. 1)	28 mm screw cap with 6 mm OD push-fit connectors
Silicone Hose (qty. 2)	6 mm OD, 4 mm ID; to be cut to length (~130 mm recommended)
BenchPro Console Software	Windows-based measurement and results interface

Table 1: Included Components

3.3 Optional Sample Bottles and Caps

For user convenience, Spectrolytic provides compatible sample bottles:

- **Volume**: ~200 mL PET bottles
- **Cap**: 28 mm screw thread (compatible with supplied cap assembly)
- **Recommended sample volume**: at least 150 mL per measurement



Figure 2: Recommended Sample Bottle (200 mL) and bottle cap with push-fit connectors

3.4 Technical Specifications

Specification	Value
Model	BenchPro
Dimensions	250 mm × 430 mm × 400 mm (including fittings and feet)
Weight	~15 kg
Input Voltage	110–240 V AC
Power Consumption	120 W (maximum)
Communication Protocol	Modbus TCP
Network Interface	Ethernet (RJ-45)
Operating Environment	Indoors (ambient temperature and humidity)
Ingress Protection	Not IP-rated; protect from liquid spillage

Table 2: Technical Specifications

3.5 Calibration Models

The system is pre-calibrated with measurement models for a defined set of industrial fluids. Each model is tailored to the specific properties of its corresponding fluid and is optimized to calculate the relevant oil condition and degradation parameters for that fluid type.

4. Safety and Handling

4.1 General Safety

The BenchPro system is designed for indoors use by trained operators. Operators should follow standard laboratory safety practices:

- **Work in a well-ventilated area** to minimize exposure to oil aerosols and vapors
 - **Wear appropriate personal protective equipment (PPE)** including:
 - Nitrile or latex gloves
 - Safety glasses or face shield
 - Laboratory coat or protective apron
 - **Avoid direct skin contact** with used fluids
 - **Handle used oil responsibly** following applicable environmental regulations
-

4.2 Electrical Safety

- **Power connections:** The system operates on standard AC mains (110–240 V). Ensure the power outlet is grounded and rated for 2.6 A minimum.
 - **Do not operate with damaged power cord:** Visually inspect the power cord before each use.
 - **Disconnect power before maintenance:** If service or cleaning is required, disconnect the AC power cord.
 - **Do not immerse the system** in water or other liquids.
-

4.3 Liquid Spill Prevention

 **Important:** The BenchPro system is **not IP-rated** and is not sealed against liquid ingress.

- **Prevent spillage:** Take care not to spill oil, water, or other liquids on the device

- **Use drip trays:** Place the system on a lab table with adequate containment (e.g., absorbent mat or drip tray)
- **Secure hose connections:** Ensure inlet and outlet hoses are properly tightened to prevent leaks
- **Check hose integrity:** Before use, visually inspect hoses for cracks, splits, or signs of damage

4.4 Waste Disposal

- **Used oil disposal:** Dispose of collected waste oil according to local environmental and regulatory requirements
- **Contaminated materials:** Any oil-saturated hoses, caps, or absorbent materials should be disposed of as hazardous waste
- **Follow local regulations:** Check with your local environmental authority for proper disposal procedures

5. Installation and Setup

5.1 Pre-Installation Requirements

Before installing the BenchPro system, verify the following:

- **Network infrastructure:** A DHCP-enabled network is required (either a network switch or a computer configured as a DHCP server)
- **Workspace:** A clean, level table or bench with sufficient space
- **AC mains connection:** A grounded power outlet (110–240 V) within 2 m of the installation location
- **Computer:** Windows-based PC with administrative access and ethernet port or network connectivity for BenchPro Console software
- **Software installation:** BenchPro Console must be installed on the connected computer

6. Physical Installation

Step 1: Position the System

- Place the BenchPro system on a clean, level lab bench
- Ensure the front panel (with inlet and outlet fittings) is easily accessible
- Leave adequate clearance around the system for hose routing and sample bottle placement



Figure 3A: BenchPro Installation with Sample Bottle (Front View)



Figure 3B: BenchPro Installation with Sample Bottle (Top View)

Step 2: Connect Inlet and Outlet Hoses

- Locate the **inlet fitting** (left) and **outlet fitting** (right) on the front panel
- Connect the supplied hoses, they come with the compression fitting nuts and ferrules pre-installed and tightened

- **Tighten the compression fitting nuts** firmly but do not over-tighten (finger-tight plus ¼ turn recommended). For more information on double-ferrule fittings, see Appendix A
- Verify there are no leaks or visible air bubbles by placing the system in circulation mode and observing the inlet and outlet hoses for 5 minutes (see Appendix B for circulation mode instructions).

Step 3: Connect Network (Ethernet)

- Plug the supplied Ethernet cable into the **Ethernet port** (front panel)
- Connect the other end to:
 - A network switch (preferred), **or**
 - An available network port on the control computer (if DHCP server is enabled on the PC)
- Verify the cable is fully inserted and secured

Step 4: Apply Power

- Connect the supplied AC power cord to the **power socket** (front panel)
- Plug the cord into a grounded AC mains outlet (110–240 V)
- The system will power on automatically; no manual power button is present
- **Allow the system to warm up** (see Section 6.2)

6.1 Software Installation and Configuration

6.1.1 Installing BenchPro Console

1. Install **BenchPro Console** on a Windows computer with administrative privileges
2. During installation, the software will create the following folder structure:
 C:\Users\Public\Documents\Spectrolytic\BenchPro Console
 - |— Models
 - |— Data
 - |— Logs\

6.1.2 Installing Calibration Models

Important: Calibration models must be installed before performing the first measurement. The calibration files are supplied on the USB drive provided with the device. Each fluid has its own calibration folder, and these folders are contained within a parent folder named with the **exact serial number** of your BenchPro system.

- Copy the entire serial-number folder from the USB drive into the Models directory, for example:

C:\Users\Public\Documents\Spectrolytic\BenchProConsole\Models\SL26CST00123\

- Within this serial-number folder, model subfolders correspond to each calibrated fluid type, for example:
 - Oil 1
 - Oil 2
 - Oil 3
 - Oil 4

- After copying, the folder structure should appear similar to:
C:\Users\Public\Documents\Spectrolytic\BenchPro Console

```
├── Models
│   ├── SL26CST00123
│       ├── Oil1
│       ├── Oil2
│       ├── Oil3
│       └── Oil4
├── Data
└── Logs\
```

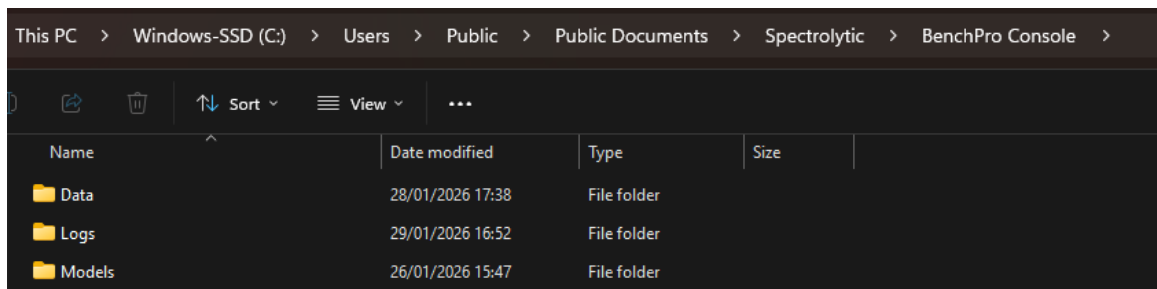


Figure 4: Expected Folder Structure

6.2 System Warm-Up

The BenchPro system contains precision optical and thermal components that require thermal stabilization before accurate measurements can be performed.

- **Warm-up duration:** Typical stabilisation time after a power cycle is 20 minutes.
- The system can also be left powered on overnight

- **First use:** Allow up to 1 hour for full thermal stabilisation

Note: Currently, the system does not display a warm-up progress indicator. Future software versions may include this feature.

7. Operation

7.1 Starting the System

Step 1: Power On

- Ensure the AC power cord is connected and the system has been powered on for at least 1 hour before the first measurement (see Section 6.2)

Step 2: Start BenchPro Console Software

- On the connected Windows computer, launch the **BenchPro Console** application

Step 3: Device Selection

Upon launch, the Device Selection dialog will appear:

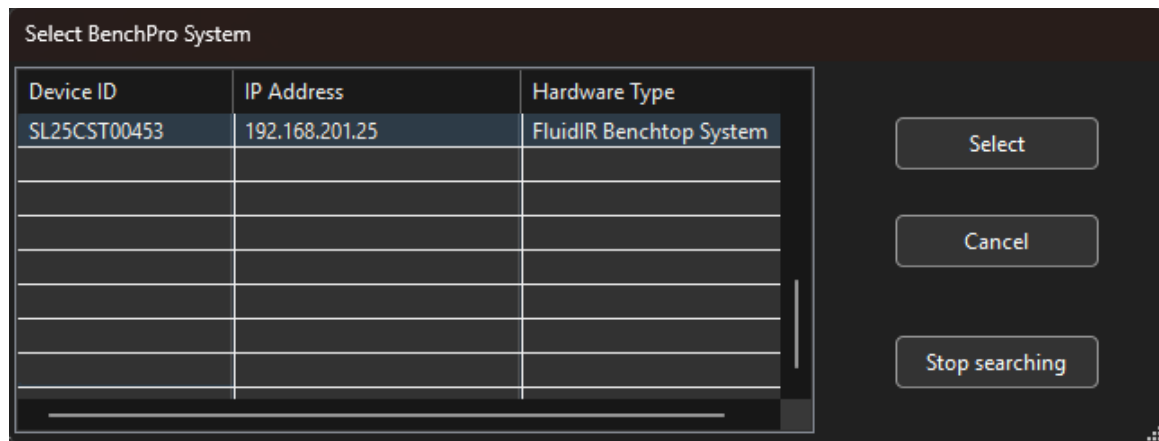


Figure 5: Device Selection Dialog

- The software will display a list of available BenchPro devices on the network
- Locate the device with the serial number of your system (SL26CST00469)
- Click the **Select** button to connect to the device

Troubleshooting: If no devices appear:

- Verify the Ethernet cable is firmly connected to the BenchPro system and the network (or PC)
- Verify that BenchPro system is powered on and has obtained an IP address (see Appendix C for instructions on viewing the IP address on the device display).

- Check that the network has an active DHCP server
- Verify the computer has network connectivity
- Restart the BenchPro Console software

7.2 Preparing a Sample for Measurement

7.2.1 Sample Collection and Storage

- Collect a representative sample of the fluid to be analyzed
- Use a clean, dry container (the supplied 200 mL PET bottles are recommended)
- Avoid contamination by dirt, water, or other fluids
- Store samples in a cool, dry location away from direct sunlight

7.2.2 Filling the Sample Bottle

1. **Measure the sample volume:** Pour at least **150 mL** of fluid into the sample bottle
2. **Assemble the bottle cap:** If using the supplied PET bottles with provided bottle caps:
 - Screw the provided cap assembly (with 6 mm push-fit connectors) onto the bottle
 - Connect one length of silicone hose (~130 mm) to inlet connector:
 - **Inlet connector:** Supplies sample to the BenchPro system
 - **Outlet connector:** Returns circulated sample to the bottle
 - Route the silicone internal inlet hose so **it is a few millimeters above the bottom of the bottle**. This prevents the hose from sticking to the bottle base.



Figure 6: Bottle Cap Assembly

7.2.3 Hose Connection Best Practices

- **Sample hoses** (device ↔ bottle / waste):
Ensure hoses are fully inserted into the compression fittings and the nuts are correctly tightened. Check that the hose routing is free of sharp bends and mechanical strain.
- **Silicone internal hoses (inside the sample bottle / if provided bottle caps are used):**
Prevent hose collapse: The silicone hoses must remain open and unobstructed. Ensure they do not collapse, fold, or become sucked against the bottle walls
- **Verify flow path:** During sample circulation, confirm that:
 - The inlet hose delivers sample from the bottom of the bottle
 - The outlet hose returns fluid to the sample bottle
 - No air bubbles are trapped in the hoses or system tubing

7.3 Measurement Procedure

7.3.1 System Initialization

1. **Connect inlet hose:** Insert the **inlet hose** into the prepared sample bottle (ensure the hose reaches the bottom)
2. **Connect outlet hose to waste:** Place the **outlet hose** into a waste collection container (oil will be displaced during flushing; ~80 mL)
3. **Prepare workspace:** Ensure the waste container has adequate capacity and is positioned to prevent spills
4. Ensure that both the sample bottle and the waste container are placed on a stable surface and are properly secured so that hose forces cannot tip or pull them over.

7.3.2 Enter Sample Information

On the BenchPro Console main screen, you will see three sections:

Figure 7: Measurement Setup Screen

Section 1: Sample ID (Top Left)

- Type a descriptive identifier for your sample (e.g., "Oil1_Batch01")
- This name will be used to organize results in the Data folder
- Sample IDs may contain letters, numbers, hyphens, and underscores

Section 2: Substance Selection (Middle Left)

- Click the dropdown menu labeled **"Substances"**
- Select the fluid type that corresponds to the sample being measured (as defined in your calibration set).
- **This selection is critical:** The system uses this information to apply the correct calibration model for accurate results

⚠ Important: Selecting the wrong fluid type will produce incorrect measurement results.

Section 3: Measurement Control (Bottom)

1. Click the **"Measure"** button (bottom left)
2. The system prompts the user to connect the outlet hose to the waste oil container (Figure 8A)
3. Once the user clicks "OK", the system begins the measurement sequence with a **flushing phase** lasting approximately **4 minutes**
4. During flushing:

- The pump displaces the previous measurement sample from the system
- Waste oil (~80 mL) flows to the waste container
- The progress bar shows measurement progression
- **Do not interrupt the process**

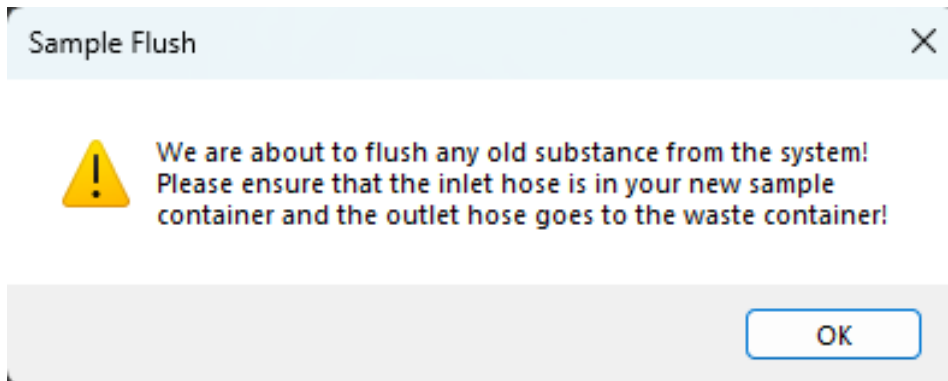


Figure 8A: Flush Prompt

7.3.3 Switch Outlet Hose to Sample Bottle

When flushing is complete, a prompt to move the outlet hose to the sample bottle will appear:

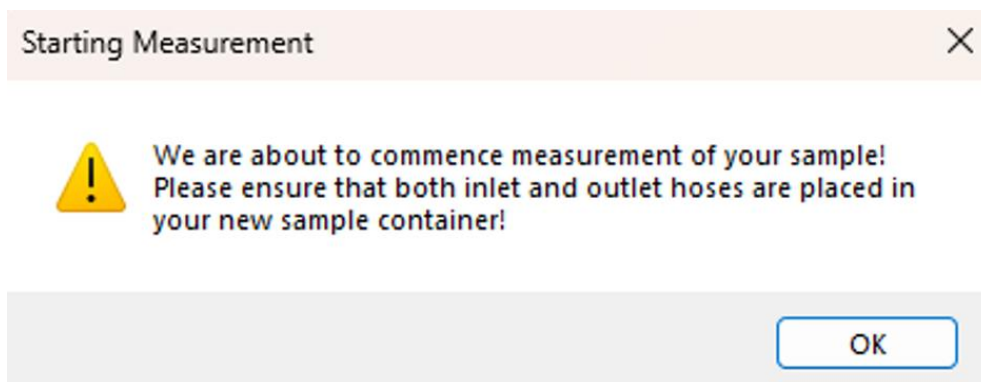


Figure 8B: Measurement Prompt

This prompt instructs you to:

- Remove the outlet hose from the waste container
- Place the outlet hose into the sample bottle (same bottle that inlet hose is connected to, ensure that inlet hose is submerged in the sample)
- Click **OK** to continue

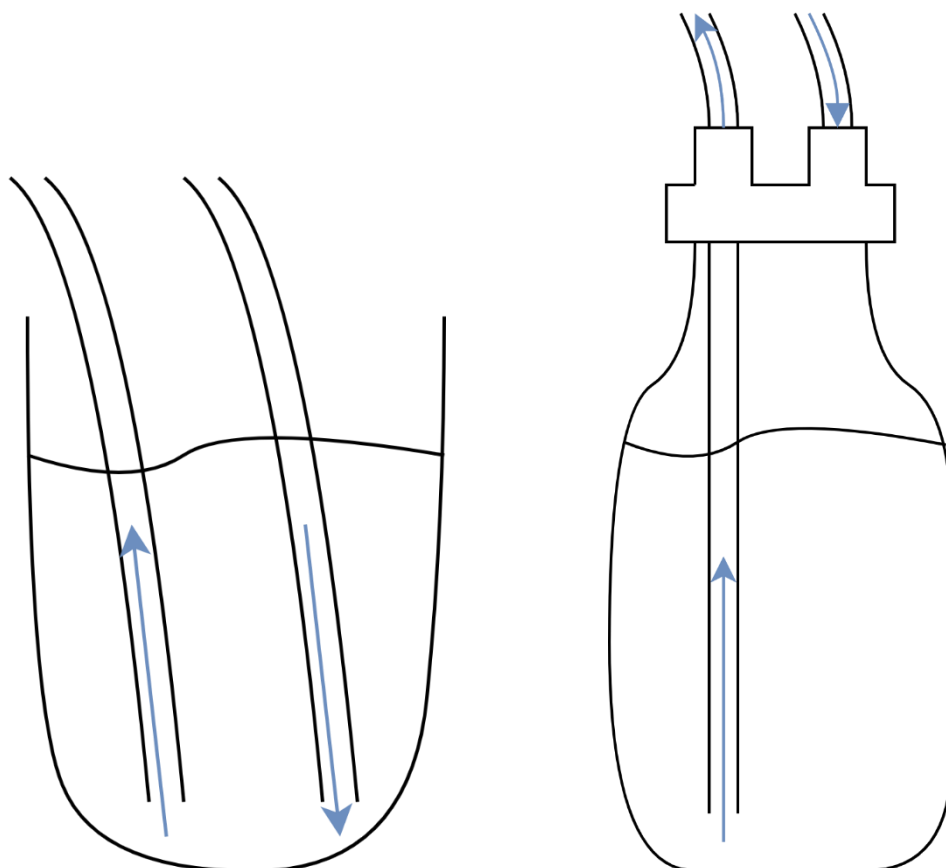


Figure 9: Illustration of different sample bottle arrangements with hoses properly submerged

7.3.4 Stabilization and Measurement

After clicking OK:

1. **Stabilization phase** (~10 minutes): The system stabilizes temperature
2. **IR measurement**: Infrared measurement captures relevant data to required for calculation of actionable parameters (oxidation, water, and TAN values)
3. **Viscosity measurement**: Dynamic viscosity and fluid density are measured, Kinematic viscosity (KV40) is calculated
4. **OPC measurement**: Optical particle counting determines ISO 4406 cleanliness and particle concentrations
5. **Total measurement time**: Approximately 15 minutes from clicking OK

Progress indicator: The progress bar provides visual feedback; progression is not linear as different measurement phases have varying durations.

7.3.5 Viewing Results

Upon completion, the measurement results are displayed on the right side of the screen:

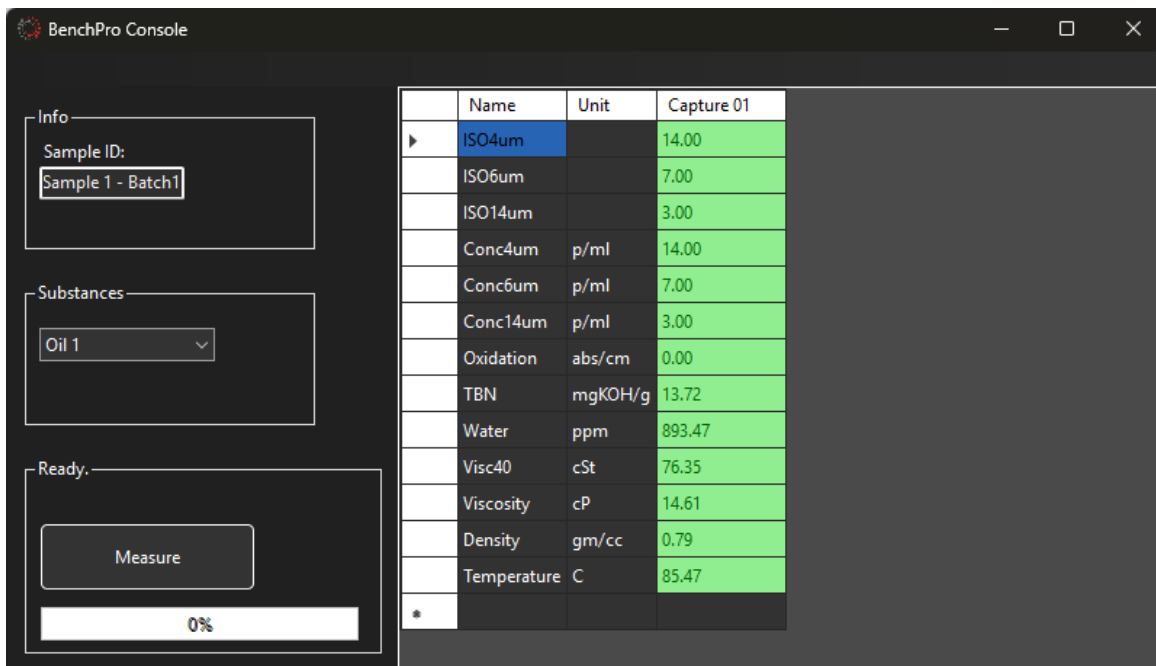


Figure 10: Measurement Results

Results typically include (depending on oil):

- **Oxidation:** abs/cm (higher values indicate increased oxidation)
- **TAN:** mgKOH/g (higher values indicate increased acidity)
- **TBN:** mgKOH/g (higher values indicate increased alkalinity reserve)
- **Water:** ppm (parts per million; higher values indicate water contamination)
- **Visc40:** cSt (kinematic viscosity at 40°C; reference for viscosity degradation)
- **Viscosity:** cP (dynamic viscosity)
- **Density:** g/cm³
- **Temperature:** °C (sample temperature during measurement)
- **ISO4µm, ISO6µm, ISO14µm:** Particle count at each size threshold (per ISO 4406)
- **Conc4µm, Conc6µm, Conc14µm:** Particle concentration (particles/mL) for each size

7.3.6 Data Storage

Measurement results are automatically saved in the Data folder:

C:\Users\Public\Documents\Spectrolytic\BenchPro Console\Data\[Sample ID]\

For each measurement, four files are created:

File Name	Description
[timestamp]_[sample ID]_IR.sl300	Raw IR spectroscopy data (technical/troubleshooting use)
[timestamp]_[sample ID]_Viscosity.sl900	Raw viscosity measurement data (technical/troubleshooting use)
[timestamp]_[sample ID]_OPC.sl900	Raw optical particle count data (technical/troubleshooting use)
[timestamp]_[sample ID]_PredictedParameters.csv	Results summary (user-readable format)

Table 3: Saved Data Files

Note: The raw data files (.sl300, .sl900) are technical files intended for troubleshooting by Spectrolytic support personnel. The CSV file contains the same results displayed on screen in a spreadsheet-compatible format.

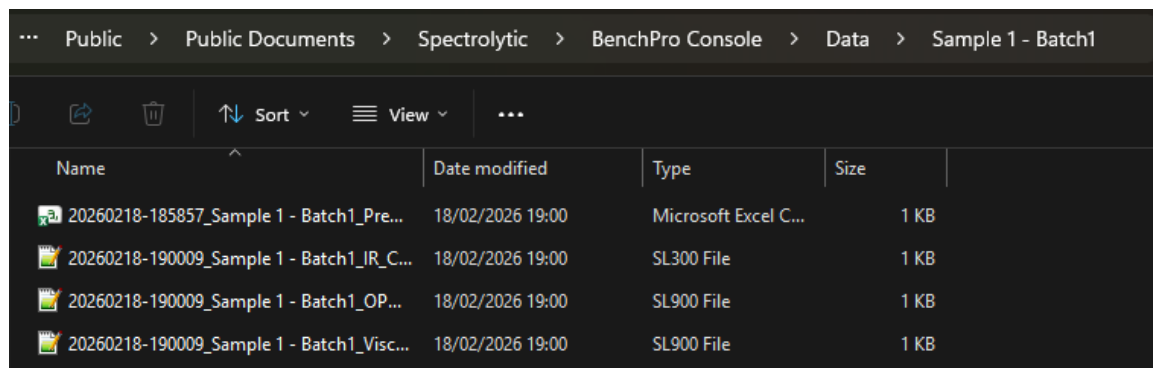


Figure 11: Example Data Folder Contents

7.3.7 Multiple Measurements on the Same Sample

- You may perform multiple measurements on the same sample by using the same **Sample ID**
- Each measurement will create separate timestamped files in the same folder
- If the same sample is used, the sample can be reused and the outlet hose can be left in the sample container for the full duration of the measurement. It is not required to connect the outlet hose to the oil waste container.

8. Result Completeness

If any measurement component (IR, Viscosity, or OPC) encounters a temporary issue:

- **Partial results:** The remaining measurements will complete and display results (failed values will be blank)
- **All measurements fail:** You will receive a system notification
 - **Cause:** Often due to incomplete warm-up, temporary sensor issue or internal routine issue
 - **Recovery:** See Section 7 – Troubleshooting

9. Troubleshooting and Support

9.1 Common Issues and Solutions

9.1.1 Issue: Irregular, Inconsistent, or Physically Impossible Measurements

Possible causes: Air bubbles in sample or system, blocked flow paths, inadequate sample circulation

Solution:

1. **Check for air bubbles:**
 - Visually inspect the inlet and outlet hoses for trapped air
 - If air bubbles are present, recirculate the sample to purge air from the system (see below)
2. **Recirculate the sample:**
 - Ensure inlet hose submerged in the sample bottle and outlet hoses connected to the sample bottle.
 - Place the system in circulation mode (see Appendix B).
 - Allow the pump to run for 5 minutes to recirculate the fluid and remove air.
 - Exit circulation mode and perform a fresh measurement attempt.
3. **Verify hose integrity:**
 - Ensure inlet and outlet hoses are not kinked, collapsed, or blocked
 - Verify the sample volume is adequate (minimum 150 mL)

- Confirm the silicone hoses (if used) reach to the bottom of the bottle without collapsing

4. Check outlet hose position:

- During measurement, visually confirm oil is exiting the outlet hose into the sample bottle
- If no flow is observed, stop the measurement and inspect the hose connections for blockage

9.1.2 Issue: No Viscosity Data Captured

Possible cause: System has not warmed up sufficiently; thermal stabilization is incomplete

Solution:

1. Allow extended warm-up:

- Power on the system and allow it to remain idle for a full **1 hour** before attempting measurement
- The viscosity sensor is particularly sensitive to temperature drift during warm-up

2. Do not interrupt warm-up: Once powered on, do not turn off or disconnect the system before completing the 1-hour warm-up period

3. Retry measurement:

- After 1 hour, attempt the measurement again
- If viscosity data is still missing, wait an additional 30 minutes and try once more

9.1.3 Issue: No IR and/or OPC Data Captured

Possible causes: Temporary system error, or transient electronic issue

Solution:

1. Power cycle the system:

- Disconnect the AC power cord from the mains outlet
- Wait **30 seconds** for internal capacitors to discharge
- Reconnect AC power and allow the system to warm up for **30 minutes**

2. Retry the measurement:

- Attempt a fresh measurement after the 30-minute recovery period
- If data is still missing, contact Spectrolytic support

3. Check for sample contamination:

- Verify the sample is clean and free of visible debris

- If sample contamination is suspected, use a fresh sample from the bulk fluid container

9.1.4 Issue: Software cannot connect to BenchPro system

Possible causes: Temporary system error, or transient electronic issue

Solution:

1. Check network cable integrity:

- Ensure that network cable is not damaged
- Ensure that network cable is properly inserted into BenchPro system and computer
- Try connection using a different network cable

2. Power cycle the system:

- Disconnect the AC power cord from the mains outlet
- Wait **30 seconds** for internal capacitors to discharge
- Reconnect AC power and allow the system to warm up for **30 minutes**

3. Reboot the computer:

9.2 When to Contact Support

Contact **Spectrolytic technical support** if:

- Troubleshooting steps do not resolve the issue
 - Error messages or system warnings appear
 - Measurement results are consistently inconsistent or out of expected range
 - The system fails to detect the device in the software
 - A possible hardware malfunction is suspected (for example, new or distinctly irregular mechanical noises, or visible physical damage).
- Note:** The system produces a pronounced pump sound during normal operation. Occasional short pump sounds are also expected and normal.

Support Contact Information:

- **Email:** info@spectrolytic.com
- **Hours:** During normal UK business hours
- **Information to provide:**
 - System serial number (SL26CST00123 or printed on top panel)
 - Last successful measurement date and results
 - Description of the issue and steps taken

- Screenshot of any error messages

10. Maintenance and Care

10.1 Cross-contamination control

The internal flush sequence and timing are designed so that the incoming sample effectively displaces and removes residual fluid from the previous measurement.

Under normal operation, cross-contamination between samples used with the supplied calibration models is not expected to have any influence on the reported results.

10.1.1 Optional internal cleaning procedure

3. If cross-contamination is a concern, prepare **150 mL** of fresh oil of the relevant type (or a sufficient volume of the actual sample, if available).
4. Place the **inlet hose** into this oil designated for cleaning.
5. Place the **outlet hose** into a suitable **waste container**.
6. Put the system into **circulation mode** and allow it to run for approximately **5 minutes** (see Appendix B for circulation mode instructions).
7. After circulation, discard the used cleaning oil and reconnect the hoses as required for the next measurement.
8. This procedure helps remove residual fluid from the internal flow path and minimizes any remaining carry-over from the previous sample.

10.2 Routine Care

The BenchPro system requires **no routine maintenance**. However, proper handling ensures optimal performance:

Keep the system clean:

- Wipe the external enclosure with a soft, dry cloth to remove dust
- Use a damp cloth (not dripping wet) if necessary; avoid water ingress
- Never use solvents, abrasive cleaners, or high-pressure water jets

Inspect connections:

- Visually check inlet and outlet hose connections weekly for signs of leaking or loosening
- Tighten compression fitting nuts if needed (finger-tight plus 1/4 turn)

Protect from liquid spillage:

- The system is **not IP-rated** and must not be exposed to liquid spills
- Place absorbent mat or drip tray under the system during operation

- If liquid is spilled on the device, immediately power it off and contact Spectrolytic support

10.3 Storage and Idle Periods

If the system will not be used for more than one week:

- If storing for longer periods, safely disconnect the AC power cord
- Store in a dry, climate-controlled location away from direct sunlight
- Cover the device with a dust cover to prevent debris accumulation

10.4 Spare Parts

The following spare parts are included:

- Compression fitting nuts (6 mm OD)
- Ferrule sets (sealing components for compression fittings)
- Spare silicone tubing (6 mm OD, 4 mm ID) for inside the sample bottle use only
- Bottle cap assemblies with push-fit connectors

For technical questions, contact info@spectrolytic.com.

10.5 What Not to Do

 Do NOT:

- Disassemble or open the system enclosure (service access is reserved for authorized Spectrolytic personnel)
- Attempt to repair internal components yourself
- Expose the system to extreme temperatures or humidity
- Subject the system to mechanical shock or vibration
- Operate the system outside the specified environmental range (indoors ambient conditions)
- Use non-standard hoses or fittings (use components supplied or approved by Spectrolytic)
- Leave the device in circulation mode for more than 10 minutes at a time
- Avoid drawing excessive sediment from the sample bottle bottom. Heavy particulate contamination may gradually clog the fluid path over repeated measurements.

11. Software Reference

11.1 BenchPro Console Overview

The BenchPro Console is a Windows-based application that provides a user interface for device discovery, sample setup, and measurement result display.

System Requirements:

- Windows 7 or later (Windows 10 / Windows 11 recommended)
- Minimum 4 GB RAM
- Network connectivity (Ethernet)
- Administrative privileges for initial setup

Main Interface Components:

- **Device Selection Dialog:** Appears on startup; allows you to select from available networked BenchPro systems
- **Main Screen:** Contains three sections:
 - **Info Panel** (top left): Sample ID text entry
 - **Substances Panel** (middle left): Dropdown for fluid type selection
 - **Measurement Panel** (bottom left): Measure button and progress bar with visual feedback on current measurement status
 - **Results Panel** (right): Displays all measurement parameters and values

11.2 Data Storage and Export

Default data location:

C:\Users\Public\Documents\Spectrolytic\BenchPro Console\Data\

Result files (CSV format):

- Can be opened with Microsoft Excel, Google Sheets, or any spreadsheet application
- Contain all measurement results in tabular format
- Include timestamp, sample ID, substance, and all measured parameters
- Can be copied or analyzed using standard spreadsheet tools

12. Specifications Summary

Parameter	Detail
Product Name	FluidInspectIR BenchPro
System Dimensions	250 mm (W) × 430 mm (D) × 400 mm (H) (with fittings)
Weight	~15 kg
Power Supply	120-240V AC, 120 W max
Communication	Modbus TCP over Ethernet
Measurement Time	~15 minutes per sample (including stabilization)
Sample Volume	Minimum 150 mL recommended
Ingress Protection	Not IP-rated; protect from liquid spillage
Operating Environment	Indoors; ambient temperature and humidity
Calibration	Pre-calibrated models provided for supported fluids

Table 5: System Specifications Summary

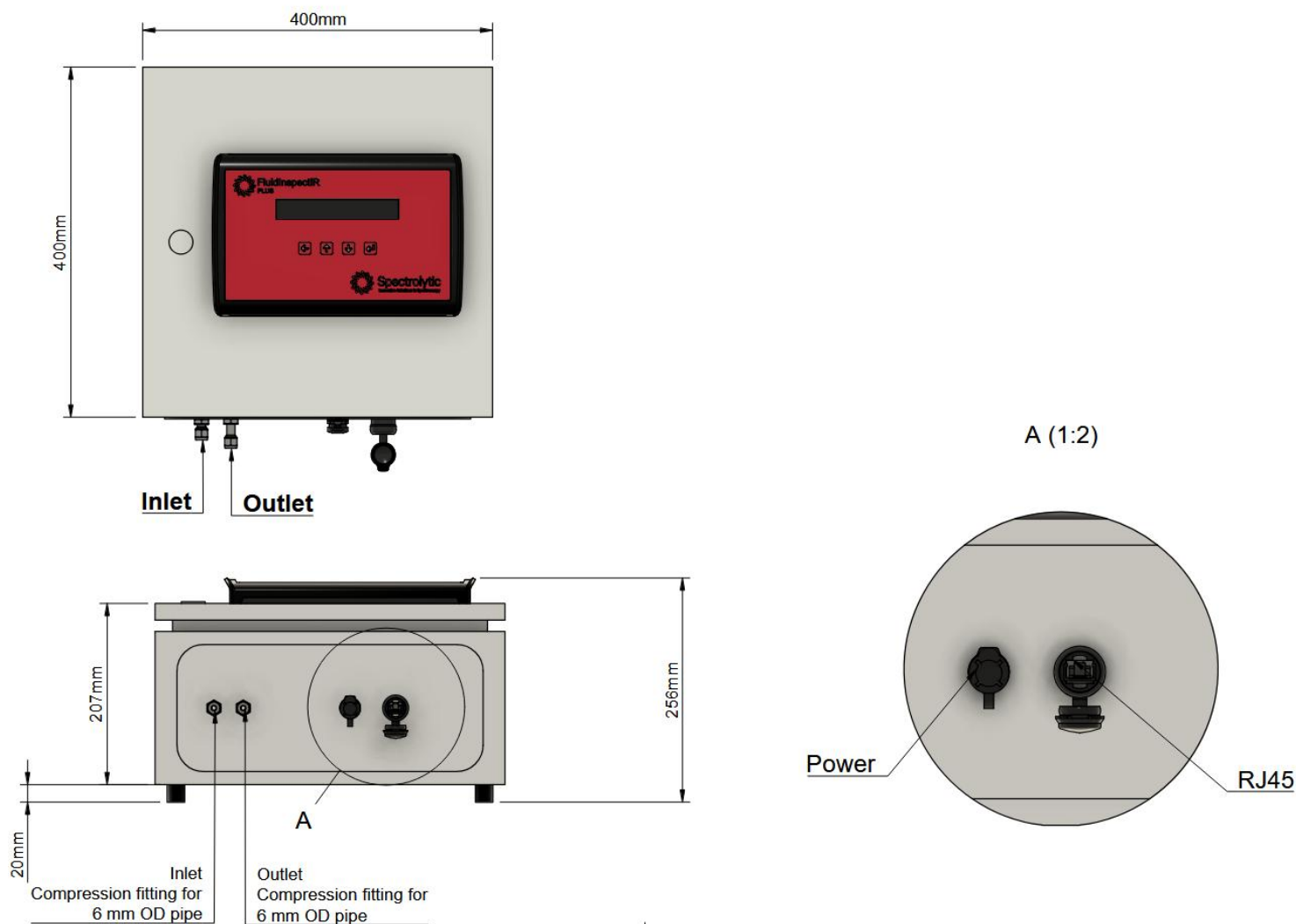


Figure 12: Technical Drawings

13. Quick Reference: Measurement Workflow

1. **Power on** the system; allow sufficient warmup time
2. **Start** BenchPro Console software on the connected Windows PC
3. **Select device** from the device discovery dialog
4. **Prepare sample:** Fill bottle with at least 150 mL; screw on cap with hoses; ensure hoses reach bottle bottom
5. **Connect inlet hose** to sample bottle; **connect outlet hose** to waste container
6. **Enter Sample ID** in the Info panel
7. **Select Substance** (fluid type) from the dropdown menu
8. **Click Measure;** let system flush for ~4 minutes
9. **Reconnect outlet hose** to sample bottle when prompted

10. **Wait** for stabilization and measurements (~15 minutes total)
 11. **Review results** on screen; results are automatically saved to the Data folder
-

14. Contact and Support

For technical support, questions, or to order spare parts:

Spectrolytic Ltd.

- **Email:** info@spectrolytic.com
- **Website:** spectrolytic.co.uk/
- **Support Hours:** 09:00 – 17:00 GMT, Weekdays

When contacting support, please provide:

- System serial number
 - Software version
 - Description of the issue
 - Last successful measurement date and results
 - Any error messages or screenshots
-

Document Information

- **Product:** FluidInspectIR BenchPro
- **Document Version:** 1.0
- **Release Date:** February 2026
- **Manufacturer:** Spectrolytic Ltd.
- **Document Status:** User Guide

For the latest version of this guide and software updates, contact info@spectrolytic.com.

End of User Guide

Appendix

Appendix A – Fluid Connections and Compression Fittings

Double-ferrule compression fittings (Swagelok-type) grip the tubing with two ferrules to provide a leak-tight, reusable metal-to-metal seal. When correctly tightened (finger-tight plus ¼ turn), the ferrules bite into the tube surface and maintain sealing performance over many connect/disconnect cycles.

Appendix B – Operation Modes (Safe / Circulation)

By default, the system comes in safe mode, where no captures take place, and the pump is off.

Using the screen and buttons, the user can manually prime the system by entering circulation mode.

- Circulation Mode

From the home screen enter the menu by pressing the enter button ↵

```
+-----+
| Status : Safe Mode |
| Menu :             |
| -> Operating Mode  |
|   System Settings  |
+-----+
```

Select “Operating Modes” using the up ↑ and down ↓ buttons and the enter button ↵

```
+-----+
| Status : Safe Mode |
| Operating Modes :  |
| -> Normal Runtime  |
|   Safe Mode        |
+-----+
```

Select “Circulation Mode using the up ↑ and down ↓ buttons and the enter button ↵

```
+-----+
| Status : Safe Mode |
| Operating Modes :  |
|   Safe Mode        |
| -> Circulate       |
+-----+
```

System now starts the pump until mode exits.

Current flow of sample is shown on the display. If flow shows 0 it indicates no sample through the system yet or inlet/outlet is blocked.

```

+-----+
| Status : Circulating |
| Circulation Mode:    |
|   Current Flow = 82.75ml/min |
|   Exit with Enter or Back key |
+-----+

```

Exit the circulation mode by pressing back ← or enter ↵ button.

System returns to Operating Modes menu and to Safe Mode.

Warning: Please ensure the device is not kept in circulation mode for more than 10 minutes.

There are multiple operating modes available, please do not select anything else apart from **Circulation** or **Safe Mode** as that may result in unexpected behaviour.

Appendix C – Network status and IP address

The user may check the network status and IP address of the system by entering the **About** menu using the screen and the buttons and opening the **Network Information** section.

In this section the user can confirm the device internet connection status (Online / Offline, note, may take up to 10 minutes to update), Hostname and IP address.

From the home screen enter the menu by pressing the enter button ↵

```

+-----+
| Status : Safe Mode |
| Menu :             |
| -> Operating Mode  |
|   System Settings  |
+-----+

```

Select “About” using the up ↑ and down ↓ buttons and the enter button ↵

```

+-----+
| Status : Safe Mode |
| Menu :             |
|   System Settings  |
| -> About            |
+-----+

```

Select “Network Information” using the up ↑ and down ↓ buttons and the enter button ↵


```
+-----+
| Status : Safe Mode |
| About : |
|   Platform Information |
| -> Network Information |
+-----+
```

View network related information including hostname and IP address:

```
+-----+
| Status : Safe Mode |
| Network Settings: |
|   Hostname: SL25FIP00234 |
| -> IPV4 Address: 192.168.201.57 |
+-----+
```