Operator Instruction Manual Lovibond® Model Fx





Lovibond[®] Colour Measurement

Part Code: 169198 Issue 3.0

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Regulatory



Disposal of Waste Electrical and Electronic Equipment

This symbol on the product or on its packaging indicates that this product shall not be treated as general waste. Instead it shall be handed over to an applicable recycling scheme or the original manufacturer for the recycling of electrical and electronic waste.

By ensuring that this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product.

The recycling of materials will help conserve natural resources. For more information about recycling this product, please contact your waste disposal service, the manufacturer or the company from where you purchased this product.

Warning

A moulded plug is fitted to the mains lead for your safety and convenience. The plug should only be changed by an approved service centre.

CO	meter Ltd declares that the stated nform to the following directives / s	
	DIRECTIVES	
	2014/30/EU 2014/35/EU	
STAND	ARDS TO WHICH CONFORMITY	IS DECLARED
EN	CISPR 11, EN 61000-4-3, EN 610 I 61000-3-2, EN 61000-3-3, EN 61 N 61000-4-6, EN 61000-4-4, EN 6 47 Parts 15.107 & 15.109, ICES Is: BS EN 61010-1	000-4-11, 1000-4-5.
	TYPE OF EQUIPMENT	
	Spectrocolorimeter	
	MODEL(S)	
	CTL-400-1001	
Signed On Behalf Of The Tir	ntometer Ltd By:	
lame: N Barnes Title: Technical Manager	Signature: N. Barres,	Date: 28/5/2014
ne: N Barnes	Signature:	

Introduction

The Lovibond[®] Model Fx instrument is a high-precision spectrophotometer, which has been designed for the objective colour measurement of clear liquids. It is an easy to use, automatic instrument which overcomes the subjectivity of visual methods. The menu system guides operators through the selection of operating parameters. Thereafter, measurements are initiated by just a single key press and take less than 5 seconds to complete. The Lovibond[®] Model Fx instrument is a rugged spectrophotometer with aluminium housing that has been coated with a hard powder coat finish to provide the best protection possible. The Lovibond[®] Model Fx has been designed to function as a QC instrument within the laboratory or on 24-hour operation in a process control environment.

The Lovibond[®] Model Fx instrument operates as a stand-alone colorimeter containing a standardised light source and collimator, sample chamber, light detector, spectrometer and processor board.

Colour scales

The Lovibond[®] Model Fx instrument has been designed to meet the colour analysis requirements of light transmitting samples such as edible oils. The Lovibond[®] Model Fx provides colour data according to the Lovibond[®] RYBN, AOCS-Tintometer[®] colour, Chlorophyll and β -Carotene colour spaces and scales.

Technical Specifications

Performance Specifications	Information
Measurement method	Spectrometer
Lamp source	Tungsten Halogen
Wavelength range	400 - 700 nm
Photometric measuring range	0 - 100% Transmittance
Wavelength accuracy	0.2 nm
Spectral bandwidth	15 nm
Photometric accuracy	0.2% Transmittance
Photometric linearity	± 0.01% Transmittance
Stray light	Less than 0.01% Transmittance
Repeatability	± 0.25% Transmittance
Wavelength resolution	1.7 nm
Detectors	Diode array spectrometer

Physical & Environmental Specifications	Information
Enclosure	Powder coated aluminium
Width	310 mm
Height	150 mm
Depth	335 mm
Weight	5.5 kg
Environmental conditions (operating mode)	Temperature : +5°C - +40°C Relative Humidity (non-condensing) : 0% - 90%
Environmental conditions (storage)	Temperature : -20°C - +85°C Relative Humidity (non-condensing) : 0% - 85%
Power	Universal via external power supply: Input range: 100 VAC to 240 VAC. 60 watts (24 volts) Frequency: 50 to 60 Hz

Unpacking

The Lovibond[®] Model Fx is supplied with:

- Lovibond[®] Model Fx Instrument
- External Power Supply
- Set of 3 Power Leads (UK, European and United States)
- Quick Start Guide
- Accessory Box Containing
 - 1 * Conformance Standard
 - o 1 * 1 inch W600/B/1" Cell
 - o 1 * 5¼ inch W600/B/5¼ Cell
 - 1 * 10 mm W600/B/10 Cell

Genuine Lovibond[®] Cells are supplied with each instrument. Only use genuine Lovibond[®] cells to ensure repeatability in test results. Other cells may not be manufactured to the same rigorous quality standards.

Replacement Lovibond[®] cells may be purchased by quoting the description (e.g. W600/B/10).

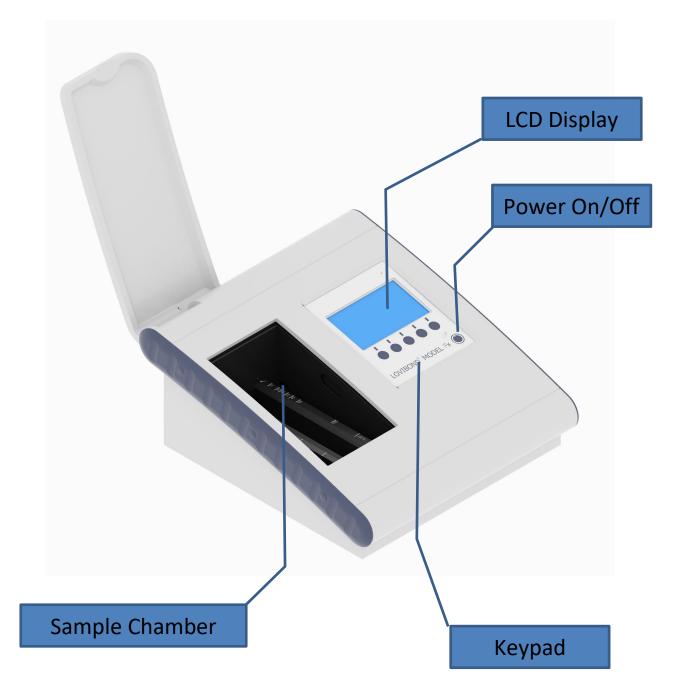
The cells are coded as follows:

- W600 = Type of cell & size/height etc.
- OG = Optical glass
- B = Borosilicate glass for high temperature samples
- 10 = 10 mm path length
- 50 = 50 mm path length

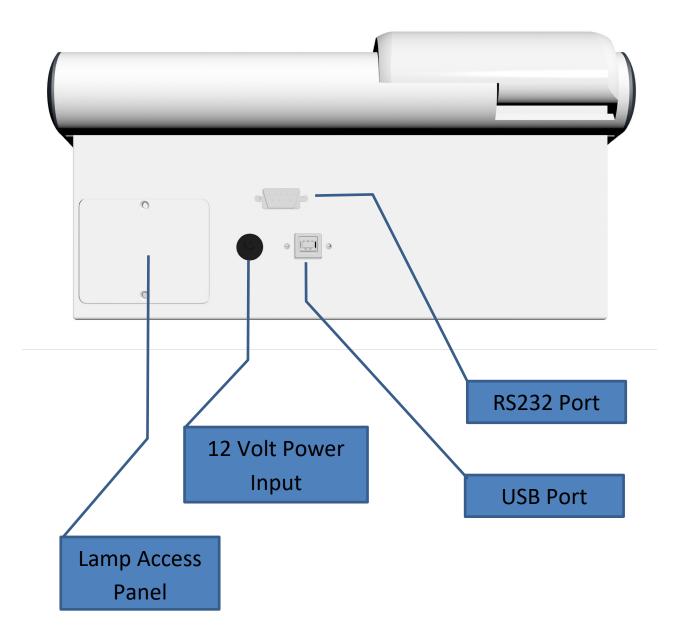
The Lovibond[®] Model Fx weighs 5.5 kg. One person may easily lift it by placing their hands at either end of the instrument and lifting. Carefully remove the Lovibond[®] Model Fx from its packing case. Remove the desiccated silica gel pack from the sample chamber. The power supply, mains lead and accessories are all included in the packaging.

The Instrument

Front View



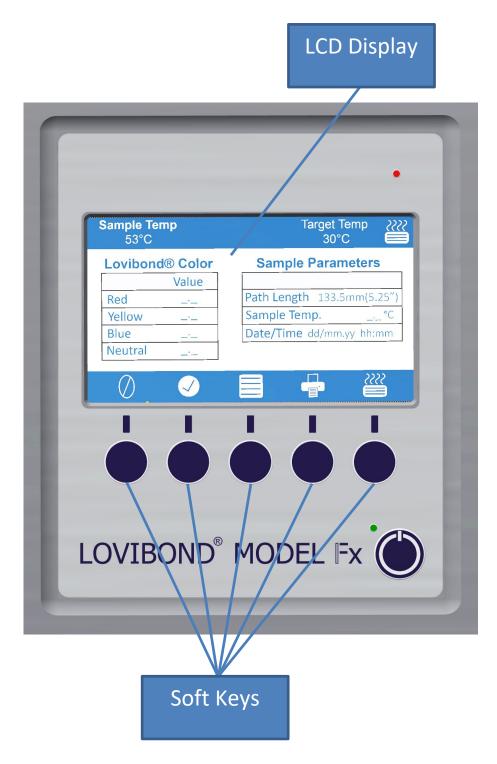
Rear View



Icons

lcon	Description
\bigcirc	Zero: Pressing this key will initiate a baseline measurement
Ø	Test: Pressing this key will initiate the measurement of a sample
	Menu: Pressing this key will bring up the main menu
Ē	Printer: Pressing this key will send the result to a printer connected to the RS232 port of the instrument
	Heater: Pressing this key will bring up the Heater control screen
	Up: Used to move between selections in the menu screen or change values in settings screens
	Down: Used to move between selections in the menu screen or change values in settings screens
	Left: Used to move between selections in the menu screen or change values in settings screens
	Right: Used to move between selections in the menu screen or change values in settings screens
ł	Enter: Used to select items from menu or confirm changes
Esc	Esc: Used to exit a menu or screen
ОК	OK: Used to accept settings and confirm settings/information
\bigcirc	Refresh: Used to manually refresh the screen, such as Diagnostics
	Instrument Registration: Used to enter registration values and unlock codes.

Keypad



The keys on the keypad can vary in their function. The function of each key will be related to the icon on the display directly above the key.

Installation

Place the instrument on a bench near a mains voltage supply which is free from excessive voltage fluctuations. The external power supply is auto voltage sensing, so no setting up is required for local voltages.



Do not operate the instrument in an atmosphere containing explosive gases.



Plug in the mains lead and switch on. The display will indicate that the instrument is on.

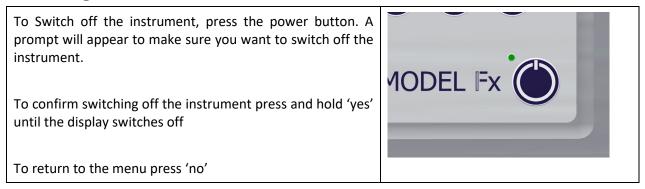
If the instrument has been in a cold environment prior to setting up, allow the instrument to warm up to room temperature and ensure that all condensation has dissipated before switching on.

Always ensure that there is sufficient free space around the instrument to maintain a constant flow of air.

Switching on the instrument

When the instrument is powered on, the display will show the serial number of the instrument.	Lovibond® Model Fx Colorimeter Serial Num. 300159
A progress bar will show status of the initialisation routines. Any errors will be shown.	Firmware Ver. v0.09
Once the initialisation has been completed, the following screen will appear.	Sample Temp Target Temp 24.0°C 25°C Lovibond RYBN
	Red Path length: Yellow Sample Temp:
	Blue Date of Test: Neutral Time of Test:

Switching off the instrument



Hardware Setup

Set Date & Time

Press the Menu Key	Sample Temp Target Temp 555 24.1°C 25°C
	Lovibond RYBN
	Red Path length: Yellow Sample Temp:
	Yellow Sample Temp: Blue Date of Test:
	Neutral Time of Test:
The Main Menu will appear. Press the Down key until "Instrument Settings" is highlighted, then press the Enter key.	Sample Temp Target Temp \\\\ 23.2°C 25°C
instrument settings is inginighted, then press the Enter Key.	Help
	Set Cell / Cuvette Path Length
	Set Heater Temperature Select Colour Scale
	Instrument Settings
	▲ ▼ 🖌 Esc 🞬
The Instrument Set up Menu will appear. Press the Down key	Sample Temp Target Temp 5555 23.8°C 25°C
until "Set Instrument Date / Time" is highlighted then press the Enter key.	Set Instrument Date / Time
	Select Language
	Set Prompt Mode
	Hardware Setup
	L I Esc ∰
The Set Time and Date screen is displayed.	Sample Temp Target Temp 5555 23.8°C 35°C
Use the Left and Right keys to move the highlighted red box between the items to be entered. At the chosen item, press	28 Jan 2019
Enter.	0 0 Save
	► ► Esc ∰
The selected Box will turn blue. Now use the Up and Down Keys	Sample Temp Target Temp ∭∬ 23.9°C 35°C 🚍
to change the value in the box. Once the correct value has been set, press Enter. The screen will now return to option of moving between items.	28 May 2019
	18 0 Save
	Esc 🎬

Once all items have been set, move the red highlight box to "Save" and press Enter. At any time, press Escape to leave	Sample Temp Target Temp ∭∬ 24.4°C 35°C ₩
screen without making any changes.	28 May 2019
	18 29 Save
	► ► Esc ∰

Language Selection

Press the Menu Key.	Sample Temp Target Temp 5555 24.1°C 25°C
	Lovibond RYBN Red Path length: Yellow Sample Temp: Blue Date of Test: Neutral Time of Test:
The Main Menu will appear. Press the Down key until Instrument Settings is highlighted, then press the Enter key.	Sample Temp 23.2°C Help Set Cell / Cuvette Path Length Set Heater Temperature Select Colour Scale Instrument Settings L V L Esc
The Instrument Set Up Menu will appear. Press the Down key until "Set Language" is highlighted, then press the Enter key.	Sample Temp Target Temp 23.8°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode Instrument Information Hardware Setup L V L Esc State State Sta
The Select Language Menu will appear. Use the Right key to move the Red selection box to the Flag of the language required. Then press Enter to select	Sample Temp 24.5°C 35°C

Prompt Mode

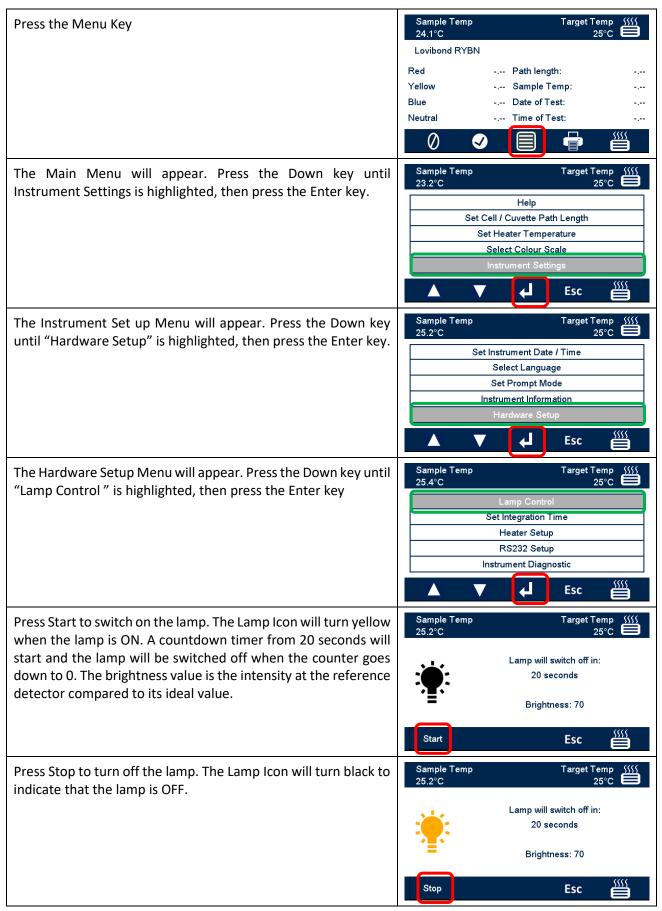
Press the Menu Key	Sample Temp Target Temp ∰ 24.1°C 25°C ₩
	Lovibond RYBN Red Path length: Yellow Sample Temp: Blue Date of Test: Neutral Time of Test:
The Main Menu will appear. Press the Down key until Instrument Settings is highlighted, then press the Enter key.	Sample Temp Target Temp 23.2°C 25°C Help Set Cell / Cuvette Path Length Set Heater Temperature Select Colour Scale Instrument Settings L V L Esc State State
The Instrument Set up Menu will appear. Press the Down key until "Set Prompt Mode" is highlighted, then press the Enter key.	Sample Temp Target Temp 23.8°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode Instrument Information Hardware Setup Large Set Prompt Mode Set Set Prompt Mode Set Prompt Mode Set Set Prompt Mode Set Set Prompt Mode Set Set Set Set Set Set Set Set Set Set
The Set Prompt Mode Menu will appear. Use the Down key to select the type of prompting required, then press Enter to select.	Sample Temp Target Temp 555 25.3°C 40°C 40°C 40°C 40°C 40°C 40°C 40°C 40

The available prompt modes are:

- **On** Any interactions will prompt user to perform certain actions, this is helpful when first using the instrument.
- Off No prompts will be requested.
- **Zero Only** User will be prompted to carry out the baseline procedure for the colour scale being measured.

Lamp

The lamp can be tested for brightness compared to the ideal factory setting.



Integration Time

Press the Menu Key.	Sample Temp Target Temp 5555 24.1°C 25°C
	Lovibond RYBN
	Red Path length:
	Yellow Sample Temp:
	Blue Date of Test: Neutral Time of Test:
	0 🛛 🗐 🖶 🞬
The Main Menu will appear. Press the Down key until	Sample Temp Target Temp \\\\ 24.2°C 25°C
"Instrument Settings" is highlighted, then press the Enter	
key.	Help Set Cell / Cuvette Path Length
	Set Heater Temperature
	Select Colour Scale
	Instrument Settings
	🔺 🔻 🛃 Esc 🎬
The Instrument Set up Menu will appear. Press the Down key	Sample Temp Target Temp
until "Hardware Setup" is highlighted, then press the Enter	25.2°C 25°C
key.	Set Instrument Date / Time
,	Select Language Set Prompt Mode
	Instrument Information
	Hardware Setup
	▲ ▼ d Esc ∰
The Hardware Set Up Menu will appear. Press the Down key	Sample Temp Target Temp \$\\\\ 25.2°C 25°C
until "Set Integration Time" is highlighted, then press the	Sample Temp Target Temp <u>\\\\\</u>
	Sample Temp 25.2°C Lamp Control Set Integration Time
until "Set Integration Time" is highlighted, then press the	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup
until "Set Integration Time" is highlighted, then press the	Sample Temp 25.2°C Lamp Control Set Integration Time
until "Set Integration Time" is highlighted, then press the	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic
until "Set Integration Time" is highlighted, then press the Enter key.	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample	Sample Temp Target Temp 555 25.2°C 25°C 55°C 55°C 55°C 55°C 55°C 55°C 5
until "Set Integration Time" is highlighted, then press the Enter key.	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Sample Temp 24.4°C Sample Temp 32°C
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Lsc Sample Temp 24.4°C Sample Temp Sample Temp Sa
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Esc Sample Temp 24.4°C Integration Time Sample Temp 24.4°C Sample Temp Sample Temp Sa
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Esc Sample Temp 24.4°C Integration Time Sample Temp 24.4°C Sample Temp Sample Temp Sa
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Esc Sample Temp 24.4°C Integration Time Sample Temp 24.4°C Sample Temp Sample Temp Sa
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample chamber is empty. Press OK when confirmed	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Sample Temp 24.4°C Sample Temp 24.4°C Integration Time Confirm Sample Chamber is empty and select Start
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Sample Temp 24.4°C Sample Temp 24.4°C Sample Temp Confirm Sample Chamber is empty and select Start
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample chamber is empty. Press OK when confirmed	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Sample Temp 24.4°C Sample Temp 24.4°C Sample Chamber is empty and select Start OK Sample Temp Sample Chamber is empty and select Start
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample chamber is empty. Press OK when confirmed	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Sample Temp 24.4°C Sample Chamber is empty and select Start OK Sample Temp 24.4°C Sample Chamber is empty and select Start
until "Set Integration Time" is highlighted, then press the Enter key. The instrument will prompt you to check the sample chamber is empty. Press OK when confirmed	Sample Temp 25.2°C Lamp Control Set Integration Time Heater Setup RS232 Setup Instrument Diagnostic Sample Temp 24.4°C Sample Chamber is empty and select Start OK Sample Temp 24.4°C Sample Chamber is empty and select Start

Time process. A progress bar will appear to show the status of the process	Sample Temp 23.4°C	Target Temp
	s	et Integration Time
	Start	Esc 🔛
When the process is complete, press "OK" to return to the Hardware Set Up Menu.	Sample Temp 24.2°C	Target Temp
	s	et Integration Time
		Done
		ок 🎬

Heater Setup

Drace the Mean Key	Sample Temp Target Temp <u>\\\\</u>		
Press the Menu Key.	24.1°C 25°C		
	Lovibond RYBN		
	Red Path length:		
	Yellow Sample Temp:		
	Blue Date of Test: Neutral Time of Test:		
The Main Menu will appear. Press the Down key until	Sample Temp Target Temp 5555 24.2°C 25°C		
"Instrument Settings" is highlighted, then press the Enter	Help		
key.	Set Cell / Cuvette Path Length		
	Set Heater Temperature		
	Select Colour Scale		
	Instrument Settings		
	▲ ▼ 🚽 Esc 🎬		
The Instrument Set Up Menu will appear. Press the Down	Sample Temp Target Temp 25.1°C 25°C		
key until "Hardware Setup" is highlighted, then press the	Set Instrument Date / Time		
Enter key.	Select Language		
	Set Prompt Mode		
	Instrument Information		
	Hardware Setup		
	🔺 🔻 🖌 Esc 🚟		
The Hardware Set Up Menu will appear. Press the Down	Sample Temp Target Temp ∭∭ 25.1°C 25°C 🚍		
key until "Heater Setup" is highlighted, then press the			
Enter key	Lamp Control Set Integration Time		
	Heater Setup		
	RS232 Setup		
	Instrument Diagnostic		
	▲ ▼ ↓ Esc 🎬		
The instrument will prompt you to check the sample	Sample Temp Target Temp ∭		
chamber is empty. Press OK when confirmed	24.3°C 32°C ा Heater Setup		
	Confirm Sample Chamber is empty and select Start		
	ОК		
Press, "Start" to begin the Heater Set up process.	Sample Temp Target Temp \\\\		
	24.3°C 32°C		
	Heater Setup		

A progress bar will appear to show the status of the process.	Sample Temp Target Temp ∭ 23.5°C 25°C ➡
	Heater Setup
	Esc
When the process is complete, press "OK" to return to the Hardware Set Up Menu.	Sample Temp Target Temp ()) 24.3°C 32°C
	Heater Setup
	Done
	ОК

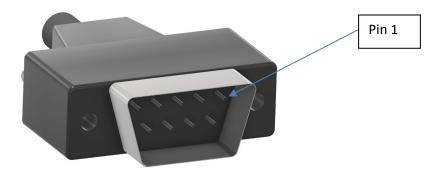
RS232 Printer Setup

Press the Menu Key.	Sample Temp Target Temp 🛒		
	24.1°C 25°C		
	Red Path length:		
	Yellow Sample Temp:		
	Blue Date of Test:		
	Neutral Time of Test:		
	0 🛛 🗐 🖶 🎬		
The Main Menu will appear. Press the Down key until	Sample Temp Target Temp ∭ 24.2°C 25°C █		
"Instrument Settings" is highlighted, then press the Enter	Help		
key.	Set Cell / Cuvette Path Length		
	Set Heater Temperature		
	Select Colour Scale		
	Instrument Settings		
	▲ ▼ ↓ Esc ∰		
The Instrument Set Up Menu will appear. Press the Down	Sample Temp Target Temp ﷺ 25.1°C 25°C		
key until "Hardware setup" is highlighted, then press the	Set Instrument Date / Time		
Enter key.	Select Language		
	Set Prompt Mode		
	Instrument Information		
	Hardware Setup		
	▲ ▼ 🛃 Esc 🚟		
The Hardware Set Up Menu will appear. Press the Down key until "RS232 Setup" is highlighted, then press the Enter key.	Sample Temp Target Temp \$		
	Heater Setup		
	RS232 Setup		
The current settings for the RS232 port will be shown.			
Press Enter to modify any setting or Esc to return to the	▲ ▼ ↓ Esc Sample Temp Target Temp ∭ 0.0°C 30°C 30°C Baud Rate 19200 bps		
	▲ ▼ ↓ Esc Sample Temp Target Temp ∭ 0.0°C 30°C 0°C Baud Rate 19200 bps Data Bits 8 Bits		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu.	▲ ▼ ↓ Esc Sample Temp Target Temp ∭ 0.0°C 30°C 30°C Baud Rate 19200 bps		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu. Pressing Change will bring up each parameter in a series	Sample Temp Target Temp 0.0°C 30°C Baud Rate 19200 bps Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu.	Sample Temp Target Temp 0.0°C 30°C Baud Rate 19200 bps Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu. Pressing Change will bring up each parameter in a series	Sample Temp Target Temp 0.0°C 30°C Baud Rate 19200 bps Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu. Pressing Change will bring up each parameter in a series of screens. To change the Baud rate, Press the Up or Down keys until	Sample Temp Target Temp 0.0°C 30°C Baud Rate 19200 bps Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu. Pressing Change will bring up each parameter in a series of screens.	Sample Temp Target Temp 0.0°C 30°C Baud Rate 19200 bps Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None Save Save Sample Temp Save Sample Temp Target Temp		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu. Pressing Change will bring up each parameter in a series of screens. To change the Baud rate, Press the Up or Down keys until	Sample Temp Target Temp 0.0°C 30°C Baud Rate 19200 bps Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None Save J Esc Save Save J Save J		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu. Pressing Change will bring up each parameter in a series of screens. To change the Baud rate, Press the Up or Down keys until the required setting is highlighted. Then press Enter.	▲ ▼ ↓ Esc ≦≦ Sample Temp Target Temp 30°C ≦ Baud Rate 19200 bps 30°C ≦ Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None Save ▲ ▼ ▲ Esc ≦≦≦ Sample Temp Target Temp ≦≦°C ≦≦≦ 4800 bps 4800 bps		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu. Pressing Change will bring up each parameter in a series of screens. To change the Baud rate, Press the Up or Down keys until	Sample Temp Target Temp 0.0°C 30°C Baud Rate 19200 bps Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None Save Save Sample Temp Target Temp 23.4°C 25°C 4800 bps 9600 bps 14400 bps 19200 bps		
Press Enter to modify any setting or Esc to return to the Hardware Set up Menu. Pressing Change will bring up each parameter in a series of screens. To change the Baud rate, Press the Up or Down keys until the required setting is highlighted. Then press Enter.	Sample Temp Target Temp 0.0°C 30°C Baud Rate 19200 bps Data Bits 8 Bits Stop Bits 1 Stop Bit Parity No Parity Flow Control None Save Save Sample Temp Target Temp 23.4°C 25°C 4800 bps 9600 bps 14400 bps		

To change the Data Bits, press the Up or Down keys until the required setting is highlighted. Then press Enter.	Sample Temp Target Temp ∭ 23.2°C 25°C ☐
	7 Bits
Press Esc to return to the previous screen.	8 Bits
	▲ ▼ ↓ Esc ∰
To change the Stop Bits, press the Up or Down keys until the required setting is highlighted. Then press Enter.	Sample Temp Target Temp ∭ 23.5°C 25°C ☐
	1 Stop Bit
Press Esc to return to the previous screen.	2 Stop Bits
To change the Parity, press the Up or Down keys until the required setting is highlighted. Then press Enter.	Sample Temp Target Temp ∭∬ 23.4°C 25°C █
	No Parity
Press Esc to return to the previous screen.	Even Parity
	Odd Parity
	▲ ▼ 🛃 Esc 🎬
To change the Flow Control, press the Up or Down keys until the required setting is highlighted. Then press Enter.	Sample Temp Target Temp ∭ 23.7°C 25°C █
and the required setting is highlighted. Then press Effect.	None
Press Esc to return to the previous screen.	RTS/CTS
	XON / XOFF
	🔺 🔻 🛃 Esc 🎬
The settings for the RS232 port will be shown.	Sample Temp Target Temp ऽऽऽऽ 23.6°C 25°C ा
	Baud Rate 19200 bps
To save the settings press the Up or Down key to highlight	Data Bits 8 Bits Stop Bits 2 Stop Bits
"Save" the press enter. Or press Escape to return.	Parity Even Parity Flow Control RTS / CTS
	Save
	▲ ▼ 🚽 Esc 🎬

RS232 Connector Wiring Diagram

If you wish to use a printer other than that supplied by The Tintometer Ltd, please use the wiring diagram below for the RS232 connector.



Lovibond[®] Model Fx

Printer

2	RX	2	RX
3	тх	3	тх
5	Gnd	5	Gnd
8	СТЅ	8	СТЅ
7	RTS	7	RTS

Instrument Diagnostics

Press the Menu key	Sample Temp Target Temp ∭∬ 24.1°C 25°C 🚍		
	Lovibond RYBN		
	Red Path length:		
	Yellow Sample Temp:		
	Blue Date of Test:		
	Neutral Time of Test:		
The Main Menu will appear. Press the Down key until "Instrument Settings" is highlighted then press the Enter key.	Sample Temp Target Temp ∭ 24.2°C 25°C		
	Help Set Cell / Currette Beth Length		
	Set Cell / Cuvette Path Length Set Heater Temperature		
	Select Colour Scale		
	Instrument Settings		
	▲ ▼ 🛃 Esc 🚟		
The Instrument Settings Menu will appear. Press the Down	Sample Temp Target Temp <u>\\\\</u>		
key until "Hardware Setup" is highlighted then press the	25.2°C 25°C		
Enter key.	Set Instrument Date / Time		
	Select Language		
	Set Prompt Mode		
	Instrument Information Hardware Setup		
The Hardware Set up Menu will appear. Press the Down key	Sample Temp Target Temp ≦555 25.2°C 25°C ██		
until "Instrument Diagnostics" is highlighted, then press the	Lamp Control		
enter key.	Set Integration Time		
	Heater Setup		
	RS232 Setup		
	Instrument Diagnostic		
	▲ ▼ 🛃 Esc 🚟		
The Diagnostic screen will be displayed. Press Enter to	Instrument Diagnostic		
initialise the diagnostic routine. A progress bar will appear to show how far along the routine is. The status of each test will	Manual Checking		
be shown as text in the middle of the screen. When the	Manual Cricking		
routine has completed, a report can be sent to the printer.	Check Keypad		
Pressing Esc at any time will exit the routine.	▲ ▼ ↓ Esc ∰		
	Checking Voltage Levels		
	Channel 1 (Vin) 20.5V		
	Channel 3 (24V Filtered) 20.5V		
	Channel 4 (3.3V) 3.3V		
	Channel 5 (5V) 4.1V		
	Channel 6 (7V) 5.8V Channel 7 (12V) 11.8V		
	🚽 🕨 斗 Esc 🚫		

Instrument Information

Press the Menu Key	Sample Temp Target Temp ∭∬ 24.1°C 25°C 🗮		
	Lovibond RYBN		
	Red Path length:		
	Yellow Sample Temp:		
	Blue Date of Test: Neutral Time of Test:		
The Main Menu will appear. Press the Down key until "Instrument Settings" is highlighted, then press the Enter	Sample Temp Target Temp 25.3°C 25°C		
key.	Help		
key.	Set Cell / Cuvette Path Length		
	Set Heater Temperature Select Colour Scale		
	Instrument Settings		
	▲ ▼ ↓ Esc ∰		
The Instrument Set up Menu will appear. Press the Down	Sample Temp Target Temp 5555 25.2°C 25°C		
key until "Instrument Information" is highlighted, then			
	25.2°C 25°C Set Instrument Date / Time Select Language		
key until "Instrument Information" is highlighted, then	25.2°C 25°C Set Instrument Date / Time		
key until "Instrument Information" is highlighted, then	25.2°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode		
key until "Instrument Information" is highlighted, then	25.2°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode Instrument Information		
key until "Instrument Information" is highlighted, then	25.2°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode Instrument Information Hardware Setup		
key until "Instrument Information" is highlighted, then press the Enter key.	25.2°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode Instrument Information Hardware Setup Esc Sample Temp <u>SSSS</u>		
key until "Instrument Information" is highlighted, then press the Enter key. The Instrument Information screen is displayed.	25.2°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode Instrument Information Hardware Setup Esc Sample Temp 25.3°C 25°C Sample Temp 25.3°C		
key until "Instrument Information" is highlighted, then press the Enter key. The Instrument Information screen is displayed.	25.2°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode Instrument Information Hardware Setup Esc Sample Temp 25.3°C 25°C Instrument Type PFXeo		
key until "Instrument Information" is highlighted, then press the Enter key. The Instrument Information screen is displayed.	25.2°C 25°C Set Instrument Date / Time Select Language Set Prompt Mode Instrument Information Hardware Setup Esc Sample Temp 25.3°C 25°C Instrument Type PFXeo Firmware Version V0.04f		

Instrument Registration

Press the Menu Key	Sample Temp Target Temp 5555 24.1°C 25°C		
	Lovibond RYBN		
	Red Path length:		
	Yellow Sample Temp:		
	Blue Date of Test: Neutral Time of Test:		
	0 🔮 🗐 👻 0		
The Main Menu will appear. Press the Down key until	Sample Temp Target Temp \\\\		
"Instrument Settings" is highlighted, then press the Enter	25.3°C 25°C		
key.	Help Set Cell / Cuvette Path Length		
	Set Heater Temperature		
	Select Colour Scale		
	Instrument Settings		
	▲ ▼ 🚽 Esc 🎬		
The Instrument Set up Menu will appear. Press the Down	Sample Temp Target Temp 5555		
key until "Instrument Information" is highlighted, then	23.9°C 25°C		
press the Enter key.	Set Instrument Date / Time		
	Select Language Set Prompt Mode		
	Instrument Information		
	Hardware Setup		
	🔺 🔻 🚽 Esc 🎬		
The Instrument Information screen is displayed. Press the Instrument Registration key.	Sample Temp Target Temp ∭ 24.3°C 35°C ➡		
The Instrument Information screen is displayed. Press the Instrument Registration key.			
	24.3°C 35°C		
	24.3°C 35°C		
	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09		
	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156		
	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Esc Sample Temp 5555		
Instrument Registration key.	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Esc State		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Esc Sample Temp 5555		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Esc Sample Temp 24.4°C 35°C		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Esc Sample Temp 24.4°C 35°C		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Image: Temp of the series of t		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Esc		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Image: Temp Target Temp 24.4°C 35°C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the Instrument Registration button.	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Image: Comparison of the series of the serie		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the Instrument Registration button. The Box chosen will turn blue. Now use the Up and Down Keys to change the value in the box. Once the correct value has been set, press Enter, this will return to the screen	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Image: Temp Target Temp 24.4°C 35°C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the Instrument Registration button. The Box chosen will turn blue. Now use the Up and Down Keys to change the value in the box. Once the correct value	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Image: Temp Target Temp 24.4°C 35°C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the Instrument Registration button. The Box chosen will turn blue. Now use the Up and Down Keys to change the value in the box. Once the correct value has been set, press Enter, this will return to the screen	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Image: Temp Target Temp 24.4°C 35°C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Instrument Registration key. The Instrument Registration Screen will appear. Use the Left and Right keys to move the highlighted red box between the items. At the chosen item, press the Instrument Registration button. The Box chosen will turn blue. Now use the Up and Down Keys to change the value in the box. Once the correct value has been set, press Enter, this will return to the screen	24.3°C 35°C Inst. Type Lovibond® Model Fx Firmware Ver. V0.09 Serial Num. 300156 Build Date 01-Feb-19 Image: Temp Target Temp 24.4°C Target Temp 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 Sample Temp Target Temp Save Image: Temp Image: Temp Target Temp 0 0 0 0 0 0		

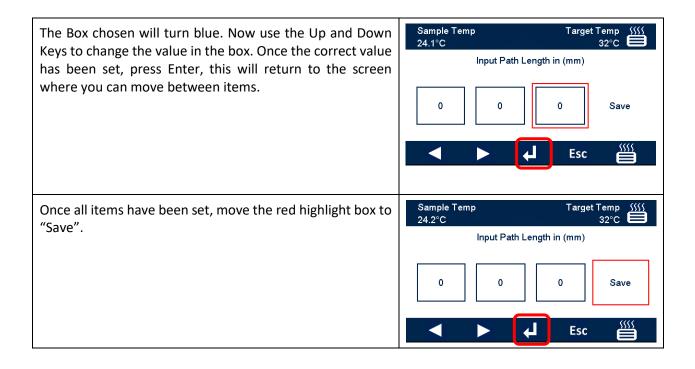
Once all items have been set, move the red highlight box to "Save". A message will then appear showing 'Success' or any error. At any time, press Esc to leave screen without making any changes.

Sample T 24.6°C	emp		Target Ta	emp 555°C
0	2	0	0	0
0	0	0	0	Save
		Ļ	Esc	

Instrument Settings

Set Path Length

Press the Menu Key	Sample Temp Target Temp 5555 24.1°C 25°C		
	Lovibond RYBN		
	Red Path length:		
	Yellow Sample Temp:		
	Blue Date of Test:		
	Neutral Time of Test:		
The Main Menu will appear. Press the Down key until "Set	Sample Temp Target Temp ∭ 23.4°C 25°C ा ■		
Cell / Cuvette Path Length" is highlighted, then press the	Help		
Enter key.	Set Cell / Cuvette Path Length		
	Set Heater Temperature		
	Select Colour Scale		
	Instrument Settings		
	▲ ▼ 🖊 Esc 🞬		
The Path Length Menu will appear. Press the Down key until	Sample Temp Target Temp \\\\ 26.3°C 35°C 🚍		
the desired path length is highlighted, then press the Enter	10 mm		
key.	172 III		
	1 in 2 in		
If the required path length is not in the menu, select "User"	5.25 in		
and press enter.	User		
	▲ ▼ ↓ Esc ∰		
Select whether the path length units should be Metric or	Sample Temp Target Temp \\\\ 22.9°C 40°C		
Imperial.			
	Metric (mm)		
	Imperial (Inches)		
	▲ ▼ ↓ Esc ∰		
The Path Length Screen will appear. Use the Left and Right	Sample Temp Target Temp //// 24.2°C 32°C		
keys to move the highlighted red box between the items. At the chosen item, press the Enter Button.	Input Path Length in (mm)		
	0 0 0 Save		
	► ► Esc ∰		



Heater Settings

Press the Menu Key or Heater Key	Sample Temp Target Temp ∭ 24.1°C 25°C █
	Lovibond RYBN
	Red Path length:
	Yellow Sample Temp:
Note: the heater settings can be accessed directly from	Blue Date of Test:
Note : the heater settings can be accessed directly from most screens where the heater key is available.	Neutral Time of Test:
The Main Menu will appear. Press the Down key until "Set	Sample Temp Target Temp ∭ 23.2°C 25°C █
Heater Temperature" is highlighted, then press the Enter	Help
key.	Set Cell / Cuvette Path Length
	Set Heater Temperature
	Select Colour Scale
	Instrument Settings
	▲ ▼ 🚽 Esc 🞬
Changing the Target Temperature	Sample Temp Target Temp 24.1°C 25°C
	Target Heater Block
Press the Up and Down keys to set the required block	Temperature Temperature
temperature, then press Enter to set.	25°C 22.3°C
temperature, then press Enter to set.	
Note: this temperature will be the temperature of the	
heater block. The heater block has an integral	Esc On
thermocouple to measure its temperature.	
Switch Heater On / Off	Sample Temp Target Temp ∭ 24.1°C 25°C ██
This key will change dependant on the status of the heater.	Target Heater Block
	Temperature Temperature
Press Switch On to turn the heater on	25°C 22.3°C
Press Switch On to turn the heater on	
Or	
Press Switch Off to turn the heater off	🔺 🔻 🚽 Esc 🛛 On
Heater Status	Sample Temp Target Temp
The status of the heater is always displayed in the top right	Target Heater Block
corner of the display. The colour of the heater icon will	Temperature Temperature
change to indicate the status of the heater:	25°C 22.3°C
White: Heater is switched off	Esc Off
Red: Heater is on and the heater is heating	
Green: Heater is on and has reached target temperature	Sample Temp Target Temp 5555 26.4°C 25°C
	Target Heater Block
	Temperature Temperature
When the heater reaches the target temperature, it will	25°C 25.9°C
flicker between 'heating' and 'reached temperature' as it	\$\$\$\$
maintains the target temperature.	₩
	▲ ▼ ← Esc Off

Colour Scales

Press the Menu Key	Sample Temp Target Temp 24.1°C 25°C Lovibond RYBN Red Yellow Sample Temp: Blue Date of Test: Neutral Time of Test:
The Main Menu will appear. Press the Down key until "Select Colour Scale" is highlighted, then press the Enter key.	Sample Temp Target Temp Sissed Temp 23.4°C 25°C 1000000000000000000000000000000000000
The Colour Scale Selection Menu will appear. Press the Down key until the desired Colour Scale is highlighted, then press the Enter key.	Sample Temp Target Temp 26.4°C 35°C Lovibond RYBN AOCS RY Lovibond 10:1 Lovibond RYBN & Chlorophyll AOCS RY & Chlorophyll Lovibond 10:1 & Chlorophyll Covibond 10:1 & Chlorophyll

Sample Measurement

Performing a Baseline Measurement

Ensure the sample chamber is empty. Press Zero	Sample Temp 24.0°C Lovibond RYBN	Target Temp ∭ 25°C
	Red Yellow Blue	Path length: Sample Temp: Date of Test:
	Neutral	Time of Test:
The screen will change to the Zero Screen with a progress Bar	Sample Temp 25.4°C	Target Temp ∭∬ 25°C 🖨
		\Diamond
The result screen for the selected colour scale will be shown without any values	Sample Temp 24.1°C Lovibond RYBN	Target Temp ∭∬ 25°C 🗮
	Red Yellow	Path length:
	Blue	Sample Temp: Date of Test:
	Neutral	Time of Test:
	0 🔮	

Performing a Test

Insert a sample into the sample chamber and then press Test	Sample Temp Target Temp 24.1°C 25°C Lovibond RYBN Red Yellow Sample Temp: Blue Date of Test: Neutral Time of Test:
When performing a test, the screen will change to the test screen with a progress Bar	Sample Temp Target Temp 25.5°C 25°C
The result screen for the selected colour scale.	Sample TempTarget Temp25.9°C25°CLovibond RYBNRed0.1 Path length: 4.0 Sample Temp: 91.0 Date of Test: 01-Jan-18Blue39.0 Date of Test: 01:00:20Neutral0.0 Time of Test: 01:00:20

<u>Help</u>

Press the Menu Key	Sample Temp Target Temp 25.5°C 25°C Lovibond RYBN
	Red Path length:
	Yellow Sample Temp:
	Blue Date of Test:
	Neutral Time of Test:
The Main Menu will appear. Press the Down key until "Help" is highlighted, then press the Enter key.	Sample Temp Target Temp 533.2°C 25°C
	Set Cell / Cuvette Path Length
	Set Heater Temperature
	Select Colour Scale
	Instrument Settings
	▲ ▼ ↓ Esc ∰
Use the Up and Down Keys to select the required Help topic.	Sample Temp Target Temp 5555 26.0°C 25°C
Then press Enter to view the Help information.	How to get best Results
	Technical Support
If "How to get best results" is selected another menu will	Connecting a printer
appear	Cleaning and Maintenance
	How to Use the Heater
	▲ ▼ ↓ Esc 🞬
Again use the Up and Down keys to select the required Help	Sample Temp Target Temp ∭ 26.1°C 25°C █
topic. Then press Enter to view the Help information.	Inter-Instrument Differences
	maintenance of a visual instrument
	Comparison of Different Instrument Versions
	Incorrect Use of Visual Instruments Limitations and Errors
	Inappropriate choice of path length.
The state file of the state of	Factors Influencing Inter-Instrument Differences in
The Help files will be displayed on screen.	Lovibond Colour Measurements
	A common query relates to inconsistencies in the Lovibond Colour values obtained for an individual sample when using different instruments (for example, an automatic Tintometer Colorimeter such as the PFX Series and a visual instrument such as the Tintometer Colorimeter Model E or F, or two different visual
	🔺 🔻 ок 🞬

Certified colour reference materials

Lovibond[®] certified colour reference materials are ideal for routine calibration of colour measuring instruments and verification of test data. They have full traceability to internationally recognised standards: AOCS and Tintometer[®] Lovibond[®] RYBN certified under ISO 9001 quality system. Each standard is with an expiry date of guarantee of colour stability and full certification including MSDS. The values indicated in the table are typical nominal values. Individual values may vary but these are always specified on the certificate of calibration supplied with each standard.

Colour Scale	Nominal Certified Value	Order Code	Accreditation
	0.3R 2.0Y (5¼")	13 42 40	ISO 9001
	1.0R 9.0Y (5¼")	13 42 50	ISO 9001
AOCS-Tintometer® Colour	1.2R 12Y (5¼")	13 42 60	ISO 9001
(AOCS Cc 13j - 97, Cc 13b - 45)	2.2R 22Y (5¼")	13 42 70	ISO 9001
	3.4R 28Y (5¼")	13 42 80	ISO 9001
	0.4R 1.9Y 0.1N (5¼")	13 40 80	ISO 9001
	1.0R 4.3Y 0.1N (5¼")	13 40 90	ISO 9001
	1.4R 7.3Y 0.2N (5¼")	13 41 00	ISO 9001
Lovibond® RYBN Colour (AOCS Cc 13j - 97)	1.6R 11.0Y 0.1N (5¼")	13 41 10	ISO 9001
	1.8R 14.0Y 0.3N (5¼")	13 41 20	ISO 9001
	2.5R 24.0Y 0.5N (5¼")	13 41 30	ISO 9001
	3.3R 33.0Y 0.3N (5¼")	13 42 30	ISO 9001

Factors Influencing Inter-Instrument Differences in Lovibond[®] Colour Measurements

A common query relates to inconsistencies in the Lovibond[®] Colour values obtained for an individual sample when using different instruments (for example, an automatic Tintometer[®] Colorimeter such as the PFX Series and a visual instrument such as the Tintometer[®] Colorimeter Model E or F, or two different visual instruments). There are many reasons why such inconsistencies can arise. We have attempted to provide below a detailed list of the main factors which influence inter-instrument differences that should help you to resolve these queries. These factors fall into four main categories:

- Poor maintenance of a visual instrument
- Comparison of different instrument versions
- Incorrect use of visual instrument
- Limitations and errors associated with automatic measurement

Poor Maintenance of a Visual Instrument

The Tintometer[®] Colorimeter Model E or F is a precision optical instrument and any discoloration of the white surfaces or dirt on the various optical components will affect the nature and balance of illumination within the instrument and result in false readings. As a result, for consistency and accuracy in colour measurement, the Tintometer[®] Colorimeter should be kept as clean as possible and the whiteness of the sample chamber and the white reference maintained. Particular attention should be given to the following areas:

Dirt and grease on the glass filters and racks. These can be cleaned with a soft cloth or washed gently with warm soapy water.

Dust and dirt which gathers in the optical viewing system and can settle on the lens and correction filter. If dirty, the optical viewing system can be dismantled and the components cleaned with a suitable soft cloth. Be sure to reassemble correctly (see Tintometer[®] Colorimeter manual).

Discoloration of the white reference. Periodic replacement is necessary to maintain accuracy of measurement.

Light source discoloration. In the Tintometer[®] Model E and earlier models, the tungsten bulbs will discolour with age so that the instrument's illumination is no longer standardised. As a result, the bulbs should be changed periodically.

Discoloration and spillage in the white light sample chamber. It is important to remove any spillage immediately and clean the chamber area.

Dirt on the bulb diffuser plates reducing the amount of illumination to the sample. These should be cleaned or replaced if dirty.

Comparison of Different Instrument Versions

Users often assume that there is only one version of the Tintometer[®] Model E and Model F Colorimeters; in fact, these instruments have, for some time, been supplied in slightly varying formats to meet the requirements of national and international standard test methods which specify use of the Tintometer[®]. In particular, BS 684 Section 1.14, ISO/FDIS 15305 and AOCS Cc13e-92, all standard test methods for the determination of Lovibond[®] colour of animal and vegetable fats and oils, specify the use of the Model F (BS 684) (previously the Model E version AF905). These instruments include racks, which are fitted with colourless glass compensating slides in the sample field and a black sheath to prevent light entering the sides of the sample cell; they will give different readings to the standard Tintometer[®] Colorimeter versions and to automatic Lovibond[®] instruments.

Incorrect Use of Visual Instruments

Incorrect use of neutral racks. The two neutral racks included with the Tintometer[®] Colorimeter should be used to dull the sample so that the brightness in the sample field and the brightness in the comparison field are comparable. Many visual instrument users fail to use neutral glasses; the result will be a lighter colour measurement to compensate for brightness in the sample field.

Inappropriate choice of path length. The optical path length of the cell used should be related to the colour intensity of the sample. As a guide, it is advisable to restrict the colour intensity of the sample to less than a total of 30 - 40 Lovibond[®] units. Using a shorter path length cell can reduce colour intensity.

Subjectivity of visual measurement. Visual measurements are influenced by the discriminatory power of operators, their interpretation of a colour match and physiological factors such as age, eye fatigue and colour vision.

Limitations and Errors Associated with Automatic Measurement

Use with samples which are turbid or crystalline. This will affect colour measurement since turbidity prevents light being transmitted through the sample.

Lack of care in sample cell cleaning and sample preparation. Any contamination, uneven mixing or a temperature gradient might distort the light transmitted through the sample and affect measurements.

Maintenance

Cleaning the Sample Chamber

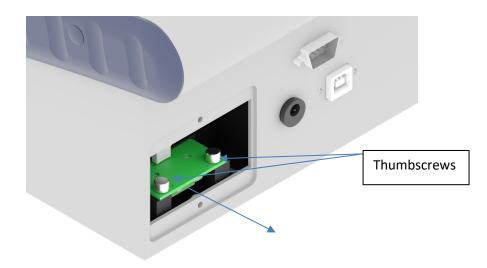
The sample chamber can be removed for routine cleaning or replacement. To remove the sample chamber, open the sample chamber lid to its full extent. The sample chamber can then be lifted free from the instrument base as shown in the diagram. Disconnect the heater power cable and thermocouple leads from the connectors in the sample chamber area to access under the sample chamber.



Replacing the Lamp

The expected lamp life is 600,000 measurements before failure. When replacing the lamp, always unplug the instrument from the power supply. Undo the two thumbscrews at the back of the instrument and remove the lamp plate, then undo the thumbscrews on the lamp assembly, remove the Lamp PCB and replace with the new Lamp PCB.

Do not touch the glass lens on the lamp, as fingerprints will impair its performance. Replace the lamp block and tighten the thumbscrews.

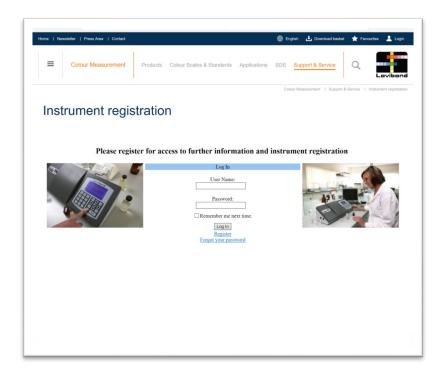


Appendix A:

Registering Your Instrument

To register your instrument, go to <u>https://www.lovibond.com/en/Colour-Measurement</u> and Support and Service. Then select Instrument registration.

To register for the first time, select register.



Home Newsletter Press Area Contact			🛃 Download basket 🔺	Favourites 💄 Login
Colour Measurement	Products Colour Scales & Standards	Applications SDS Su	pport & Service	Lovibond
		Colour M	easurement Support & Service	Instrument registration
Instrument regis	stration			
0				
	Sign Up for Your New User Name:	* Account		
	Password:	*		
	Confirm Password:	*		
	Email: Security Question:			
	Security Answer:			
	First Name:			
	Last Name:	*		
	Company:			
	Address:	•		
	:	_		
	County: Country:	•		
	Zip Code:	•		
	Tel:	_		
	Fax:			
	Crea	ate User		Cancel

Fill in the required information. Any fields with a red "*" by the side are required and must be filled in. If, as in the example above, the two password fields do not match, a red warning will appear at the bottom of the page.

Once all the fields have been filled with the required data, Click "Create User".

sme Nev	vsletter Press Area Co	ontact		English 🛃 Download basket	★ Fevourites 💄
≡	Colour Measurem	Products Colour Scales	& Standards Applications SDS	Support & Service	
				Colour Measurement Support &	Service Instrument reg
Inst	rument re	egistration			
		0			
My Det	ails Change Password V	View Instrument Register Instrument	Request Agent Access		Logo
	StockCode	Description	SerialNo	Purchased	

Click on "Register Instrument"

me Newsletter Press Area Cont	act	🌐 English 🛃 Download basket 🌟 Favourites 💄
1		
Colour Measureme	Products Colour Scales & Standards Appli	ications SDS Support & Service Q
		Colour Measurement Support & Service Instrument re
Instrument re	gistration	
	9	
My Details Change Password Vie	ew Instruments Register Instrument Request Agent Access	Log
	Instrument Serial Number * Registration Code *	
	Registration Code -	
	Date of Purchase *	
	Promotional Code	
	Supplier Name*	
	Supplier Address 1	
	Supplier Address 2	
	Supplier Address 3	
	Supplier Address 4	
	Supplier City	
	Supplier Country Supplier Zip	
	Supplier Tel	
	Submit	

Information about the instrument can now be entered. The serial number of the instrument can be found on the label at the rear of the instrument. The registration code can be found on the Certificate of Conformity for the instrument. Please fill in the details of the supplier of the instrument. This allows The Tintometer Ltd to inform them of any issues.

At the end of the process, a confirmation of registration is provided.

				sasurement Support &	Lovibone Service Instrument registratio
Inetr	umontr	ogiotrati	on		
msu	umenti	egistrati	011		
My Detail	s Change Password	View Instruments R	tegister Instrument Edit Website Data		Logout
		StockCode	Description	SerialNo	Purchased
Details	Certificates	1379951H	PFXi-995 - Example used in literature.	100307	26/01/2017
Details	Certificates	1379951	PFXi-995	100312	18/06/2018

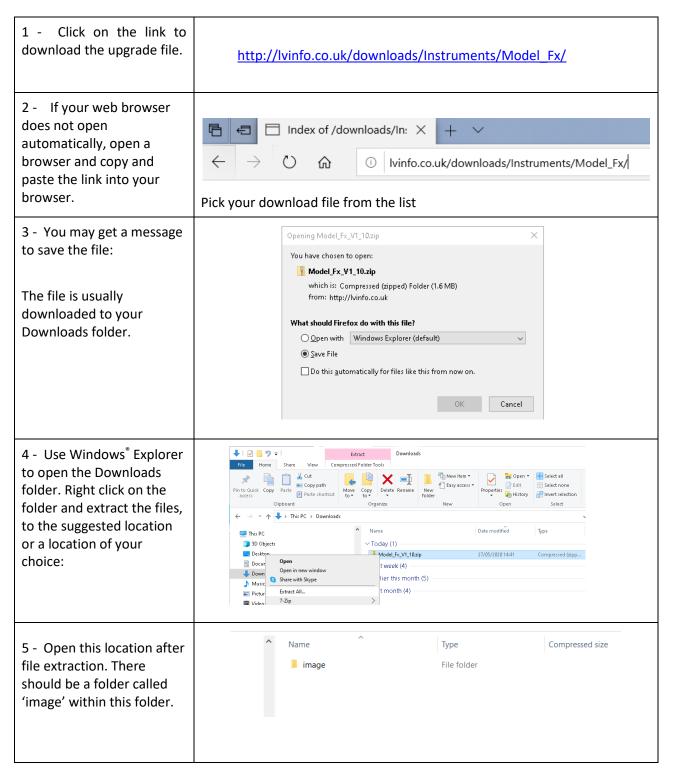
The instrument is now registered.

By selecting an instrument, it is possible to view its registration code. This can be done for each instrument that has been registered.

Appendix B:

Upgrading the Firmware

To download the files required to upgrade your Lovibond[®] Model Fx instrument, please follow these instructions:



Upgrading the instrument

For the latest version of the Lovibond[®] Model Fx firmware, please contact <u>service@tintometer.com</u>.

1 - Connect the Lovibond [®] Model Fx Instrument to the host computer using the USB cable provided.					
2 - Turn on the instrument	·				
3 - If an 'Autoplay' popup appears on the host computer, select 'Open folder to view files'.	AutoPlay ESD-USB (F:) General options Open folder to level fles Use the dive for bodius				
4 - Otherwise, open Windows [®] explorer and select the appropriate Removable Disk.	Image: Second and Second an				
5 - The disk contents will be similar to the following:	Name Date modified Type Size Image 23/03/2016 16:23 File folder CheckSd.bin 01/01/2013 11:00 BIN File 1 KB FRR.OG.TXT 01/01/2013 11:00 Text Document 1 KB Pr000.V1a 01/01/2013 11:00 V1A File 1 KB Pr-01.V1a 01/01/2013 11:00 V1A File 1 KB SETTINGS.BIN 01/01/2013 11:00 BIN File 1 KB				
6 - If the 'Image' folder is present, delete it and its contents.	Name Date modified Ty Image 23/03/2016 16:23 Fili CheckSalbin 01/01/2013 11:00 Bil ERRLOG.TXT 01/01/2013 11:00 Te				
7 - Copy the new 'Image' folder from the upgrade package to the instrument.					
8 - Turn off the instrument.	Ċ				
9 - Press and hold the left hand button on the instrument keypad. Whilst holding this button, turn the instrument on. The screen will turn white while the instrument is installing the upgrade					

package. When installation is complete, the instrument turns off.	
10 - Turn the instrument on.	·
11 - Confirm that the Firmware has been successfully installed by checking the Firmware Version field on the information screen (see xxx for details).	

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