

Lovibond® Colour Measurement

Tintometer® Group



TA 4 Online

- ✓ Continuous, online colour measurement for precise process control
- ✓ Flexibility through full range of industry-standard colour scales
- ✓ Seamless integration into production process - correlation with other instruments
- ✓ Eliminates time-loss and cost for sampling and lab measurements
- ✓ Enables alarm functionality for unpredictable readings
- ✓ Ease-of-use with touch screen input and display of graphs
- ✓ Facilitates multiple measurement locations throughout the plant
- ✓ Full consultation from Lovibond® trained personnel throughout the installation

Lovibond® TA 4 Online System

The Lovibond® TA 4 online system enables instant monitoring of colour quality throughout the manufacturing procedure. With assisted implementation by trained Lovibond® personnel, it is designed to be an easy-to-use monitoring system with the accuracy guaranteed of the Lovibond® brand.

The online system provides objective colour data for continuous process control, allowing near real-time process information to be obtained at a low analytical cost. The system can be used for the measurement of constituent concentrations, early detection of trace contaminants and quality assurance analysis. Analytical results can be fed back for automatic process control and optimisation.

This new generation of online colorimeters utilise diode array spectrophotometers which measure a near real-time response across the spectrum (380 to 780 nm) at 10 nm or less. This spectrophotometric approach allows for the use of internationally recognised colour coordinate systems, such as CIELAB and CIE xzY with the subsequent translation of colour data to industry specific colour scales, as referenced by standardising bodies such as AOCS, DGF, ISO and ASTM.

System Assembly

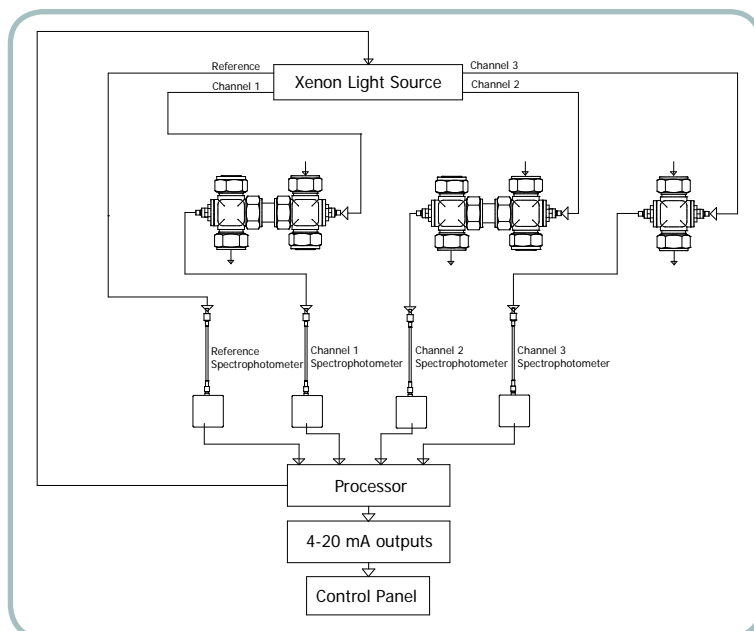
The assembly consists of a Central Control Unit with a reference spectrophotometer. The Control Unit can accept signals from up to 3 flow cells to each of which up to 4 remote signals eg red, yellow, chlorophyll and CIELAB L* can be connected.

The Central Control unit may be housed in a central location up to 45 m away from each cell.

There is no limit as to how many configurations may be installed in the plant but each Central Control Unit runs independently and must be monitored separately.

Colour Scales Supported

AF960 Lovibond® RY
Lovibond® RYBN
AOCS Tintometer®
Gardner
FAC
Platinum Cobalt, APHA, Hazen



Lovibond® TA 4 System Assembly

Get Started with the Lovibond® Team

A team of Lovibond® trained engineers is on-hand to help. With the company's in-depth knowledge of colour science, they can provide advice from colour scales, through recommended path lengths to implementation 'best practice'.

Lovibond® support extends further with the TA 4 online system. On-site visits to the factory plant can be arranged for both pre- and post technical meetings, highlighting areas of consideration, advising on implementation and seeing the process through to completion. The instrument can be fully tested and commissioned on-site by Lovibond® trained personnel.

For post installation, the Lovibond® Service Agreement ensures continued support such as hotline service, on-site maintenance, guaranteed spare parts and loan equipment to make sure the equipment is not out of commission for any length of time.



Colour Testing Made Simple

The TA 4 Central Control Unit provides a touchscreen panel which is used to display the Lovibond® developed operating software for the system. The Windows® interface is intuitive, making configuration and readings easy for any of the plant team.

The interactive setup screen enables the user to program details of both the reference spectrophotometer and those of the three flow cells.

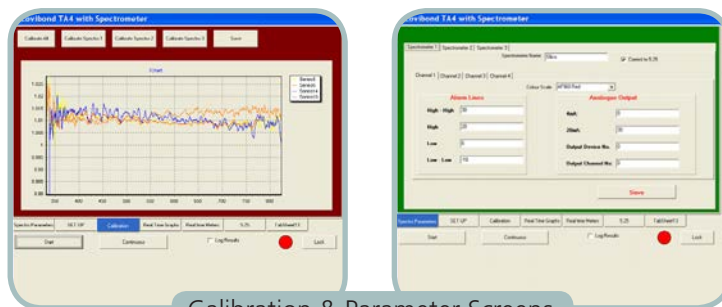
Once in deployment, the display can be set to show different measuring points and the output scale can be selected. The colour scales can be viewed in two formats: either as a real-time graph for a single scale at a chosen measurement point or as a set of the latest values for all the scales at all the measurement points.

Switching between views is achieved by selecting from the tabs along the bottom of the display area. Measurement "Start" and "Continuous" / "Stop" buttons and setup screens are recommended to be hidden during normal operation. Additionally, they are password protected to prevent unauthorised access and tampering with the instrument functions.

Data sets can be saved for processing and storage for future analysis, traceability and trend monitoring. The colour control software enables the generation of spectral and CIE diagrams as well as analysis of spectral data.

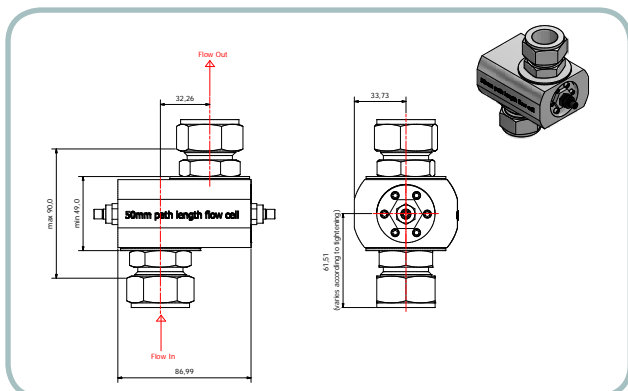
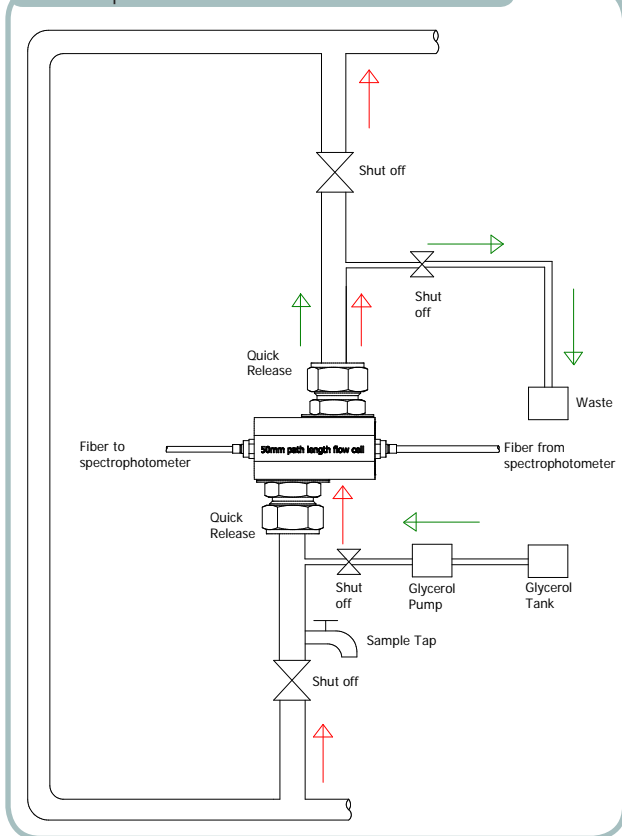


TA 4 Setup Screens



Calibration & Parameter Screens

Example 50mm Flow Cell Installation



Plant Installation

The Lovibond® installation provides up to four 4-20mA outputs per measurement point which can be linked to existing plant control panels. Various parameters can be selected for these outputs, and the range of output tuned specifically to values of interest to provide maximum accuracy.

These outputs can also be used to monitor air bubbles in the sample and turbidity, which may affect colour results.

Cabinet Installation

The cabinet should be sited in a suitable position where the screen can be easily accessed. Designed to be wall-mounted, the fibre optic and other connections can be either at the top or the bottom of the cabinet, factory configured to the user's requirements.

The cabinet weighs 24 kg and has 4 mounting holes in the back of the unit.

A mains electricity supply, 100 - 240 VAC, needs to be made available to the TA 4 system. There is access for the power cable located in the bottom right hand corner of the panel inside the cabinet.

Fibre Optic Installation

Fibre optics are very fragile and need to be installed with care. During installation, the fibre optic should be kept as straight as possible and not be bent further than the minimum radius of 160 mm stated on the fibres. The fibre optics should either be contained within a conduit or fixed at 0.5 m intervals to suitable trunking or mounting points.

Please note: protective, armoured sleeves are available as optional accessories.



Flow Cells

Three different flow cell path lengths are available: 1 inch, 5 1/4 inch and 50mm, to fully optimise performance for specific plant requirements and colour value range of interest. For low absorbance materials, a longer pathlength, such as the 5 1/4 inch, should be utilised. For dark samples, a shorter pathlength would be advised. It is important that this is stipulated at the beginning of the design-in phase and the Lovibond team of engineers is happy to advise in this matter.

System Flow Cells

1" cell: The flow cell is fitted with Swagelok fittings and collimating optics. The flow cell provides an optical path of 1 inch.

50 mm cell: The flow cell is fitted with Swagelok fittings and collimating optics. The flow cell provides an optical path of 50mm.

5 1/4" cell: The flow cell cell is fitted with Swagelok fittings and collimating optics. The flow cell provides an optical path of 5 1/4 inches.

Fibre optic cables are connected to the flow cells by means of SMA905 connectors.



Technical Specification

Measuring Principle	2048 element photodiode array
Spectral Response	320 nm to 780 nm
Resolution	1 nm
Fibre Optic Cable Length	Up to 45m between control housing and flow cell (x2 per flow cell)
Fibre Optic Cabling	Internal: Kevlar reinforced PVC sleeve or a chrome plated brass helicoil sleeve. External: Chrome plated brass helicoil sleeve for heavy industrial applications.
Repeatability	AF960 Lovibond® RY: +/- 0.2 Red (0-10), +/- 0.5 Red (10-40), +/- 0.2 Yellow (0-10), +/- 1 Yellow (10-20), +/- 2 Yellow (20-30), +/- 5 Yellow (30-70)
Measurement Time	Less than 5 seconds (depending on length of fiber optic cable)
Calibration	Calibration loop filled with food grade glycerol, automatic calibration program included with software
Light Source	Xenon Flash Lamp, monitored by a reference spectrophotometer to ensure measurement stability
Illuminants	CIE Illuminant A, B, C, D65
Observer	2°, 10°
Path Length	1 inch, 50mm, 5 1/4 inch
Output	4-20mA (4 per sample point), USB, Ethernet 10/100
Data Storage	100,000+ Measurements
Input Voltage	100-250 VAC auto sensing
Display	Embedded PC with touch screen display, internal hard drive Windows® XP operating system
Instrument Housing	Metal cabinet to IP66
Dimensions	Width 500, Depth 300, Height 500 (mm)
Power Consumption	500 Watts
Fuse Rating	UK: 230 Volts, 5 Amp
Instrument Weight	24 kg
Temperature Range	Operating: +5°C - +40°C, Storage: -20°C - +85°C
Relative Humidity	(non-condensing) Operating: 0% - 90%, Storage: 0% - 85%

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