

Palintest

Water Analysis Technologies



Made in UK



Lumiso Ammonia

User Manual

ZIINST65 V1

About us

A Rich History of Innovation

Palintest are committed to making water analysis technologies simple and accessible.

A Global Company with a Local Approach

- USA
- UK
- China
- Australia



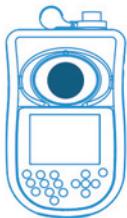
75 Years of Research

We have built up an extensive online library, with research and insights about our products and the applications they serve.



Product Range

From multiparameter photometer kits to visual test Palintest has an instrument solution for every application.



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4 Getting Started

Thank you for choosing a Palintest Lumiso Photometer.
Please take time to read and follow the advice in this manual.
If this instrument is used in ways not specified, the protection
it provides and its accuracy may be impaired.





Waterproof USB port

Integral
Dust Cover

Non-Slip
Rubberised Base

Serial Number

Battery Cover
with Captive Screw

Non slip rubber feet

Integral USB
Dust Cover



LP123456789

Made in the UK

3x

LRE



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
How to Select and Perform a Test


This is the basic procedure for all tests. For specific test details please refer to the Test Instructions.

1





The test selection menu appears when first starting up Lumiso.



From most other screens, pressing "back"  once or twice, will take you back to the test selection menu.


Select a test, using the up and down keys  until the desired test is highlighted.

2



These tube icons   will usually appear.

These indicate that the left key  is for "blanking" and the right key  is for "reading"

Please Note: The read icon  only appears after the blanking stage has been completed. Lumiso will require blanking to be repeated after 50 minutes or if it registers a significant change in environmental temperature.

Blank

Read

Blanking

Blanking sets the zero value for the test and is required on most occasions a test is carried out. Blanking is slightly different depending upon whether the test format is a tablet test or liquid Tubetest.

Ammonia Tablet Test

3a



Use a photometer tube with 10 mL of the water being tested without any reagent tablets added.

Place this in the cell holder

Ammonia TUBETESTS®

3b




Place an unused tube in the cell holder fitted with the Tubetest Adapter.

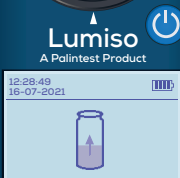
Alternatively, if the water being tested is strongly coloured or cloudy, a blank can be prepared by adding the correct volume of sample to a tubetest and using it as the blank before any Nessler reagent or Indophenol Tablet is added.

4



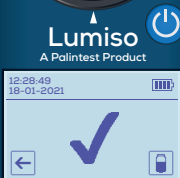
Press blank 

5




The screen will show that the blank is being measured.

6



This indicates that blanking was successful.

If after blanking, you want to read a different parameter press the back key  to go to the test menu. Providing the tube size is unchanged, Lumiso will allow a different test to be "Read" without needing to blank again.

Ammonia Tablet Test

7a



Prepare a 10ml sample by adding reagents to it according to the test instructions.

Place this sample tube in the cell holder

Ammonia TUBETESTS®

7b



Follow Test Instructions for type of tubetest being used.

Then place tube in cell holder fitted with adapter.

8



Press read.



Depending upon test selected, Lumiso will either go to step 10, or show intermediate step 9.

For Tests with a Wait Time Only

9



For tests with a "wait time" (see test instructions), a preset timer will count down and then automatically commence reading.

Press read  to override

10



The screen will show that the sample is being measured.

11



The result will be displayed with the following information

Time and Date

The Test Name from the Menu

The Measured Result

Press back  from this screen to go to the test selection menu.

Lumiso will display these messages as M numbers, if it detects unexpected readings when making its optical measurements

Message Number	Likely Cause	Suggested Action
M1 and M2	Blank is too dark	Check and clean all glass tubes used. Repeat blanking process
	Contamination obscuring optics	See "Keeping the Optics Clean"
M3 and M4	Blank, sample tube, or NDF standard moved or removed too early	Carefully repeat blanking and reading procedure
M5	Light cap not fitted correctly	Check or change light cap on tube
	External light entering the optical cell	Move instrument away from external light

A common cause that can trigger any of these messages to be displayed is contamination of the optical windows or stained glassware. See sections Keeping the Optics Clean and How to Get Accurate Results. If messages continue to be displayed, please contact your local Palintest branch or distributor.

Keeping the Optics Clean

Contamination in the optical cell may effect the accuracy of readings and can trigger an information message to be displayed.

Clean optical windows gently with a soft, non-abrasive cloth dampened with water or anti-static foam cleaner. Do not use solvents.


Instrument failure due to contamination is not covered by warranty.

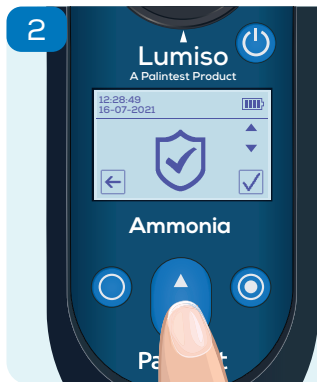



A number of additional functions and settings can be accessed from within the Settings Menu.



The Settings Menu is accessed from the opening Test Selection Menu.







Select  and confirm



Use the  key to scroll through the options.

Press confirm to explore that option

Press back to go back to the Test Selection Menu.

	<p>Check Standard Mode: Verify instrument performance using NDF check standards</p>
	<p>Label Mode: Assign a label to your measurement</p>
	<p>Log Mode: Access the last 50 measurement results</p>
	<p>QR Log Mode: Access a QR code that contains the current log.</p>
	<p>Date & Time Mode: Manually edit the date & time in the instrument. Date format can also be changed.</p>
	<p>Brightness Control Mode: Adjust the brightness of the screen backlight.</p>

16 Using Check Standards

Check Standards can be purchased separately for your Lumiso instrument. These standards contain Neutral Density Filters (NDFs) and can be used to verify that the instrument is within calibration and performing correctly.




Check Standards Certificate					
For use with instruments :			Lumiso Ammonia		
	Wavelength 620 nm		Wavelength 465 nm		
	Min	Max	Min	Max	
Standard A	69%T	74%T	69%T	74%T	
Standard B	24%T	28%T	24%T	28%T	



Why is Percentage Transmission of Light being measured with Lumiso Check Standards?

Lumiso works by measuring the amount of light that passes through the sample. This value is known as the "Percentage Transmission" or "%T". Lumiso's software then converts this %T value into a concentration, such as mg/L of chlorine. So, to verify that the instrument is within calibration it is only necessary to check that the instrument correctly measures %T for each wavelength of light it uses. This simplifies the process for using check standards.

1



Check Standard Mode is accessed from the Settings Menu 

Scroll to the Check Standard icon  and confirm 

2



The wavelengths of light the instrument uses are shown in nanometres (nm).

All wavelengths will need to be verified.

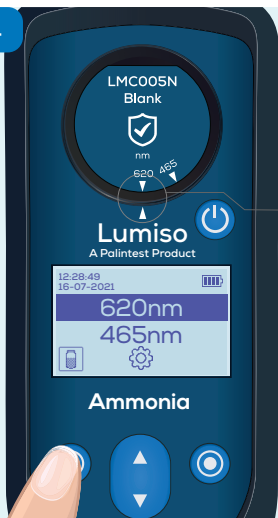
If nothing is shown here, it is because Lumiso has not been “blanked” on the wavelength highlighted.

3




To set the blank (zero) value for the selected wavelength. Insert the "Blank" from the set of standards.

4



Ensure that the wavelength being checked is aligned with the mark on the Lumiso instrument.

Then press blank 

5



The instrument will measure the blank and show when this has been successful.


A read icon now appears.

6



Insert Standard A from the set of standards

Ensure that the correct wavelength is aligned.

Then press read 



The measurement of %T (Percentage Transmission) is shown on screen.

This value needs to be compared with that on the certificate for the correct wavelength and standard.

Please Note: The certificate shown here is for illustration only. Please refer to the certificate supplied with the set of standards.



Check Standards Certificate

For use with instruments :

Lumiso Ammonia

	Wavelength 620 nm		Wavelength 465 nm	
	Min	Max	Min	Max
Standard A	69%T	↔ 74%T	69%T	↔ 74%T
Standard B	24%T	↔ 28%T	24%T	↔ 28%T

8



Continue, by inserting all the remaining standards, pressing read, and comparing the result with certificate.

Then repeat the entire process (blank, read A, read B) from step 2 onwards for all wavelengths.

Should any standard read outside the values shown on your certificate, the most likely cause is contamination on the optical windows in the cell holder. Please clean the cell holder carefully and remeasure the standards.


If this does not resolve the issue, please contact your local Palintest branch or distributor.



22 Accessing the Results Log

Lumiso stores the most recent 50 test results along with the test time, date and sample label. The oldest test result will be automatically overwritten once this capacity is reached.

1




The Results Log is accessed from the Settings Menu 

Select the "Results Log" icon  and confirm 

2



The screen will show the most recent result with its time and date.

Use the up and down keys  to scroll through up to 50 results.

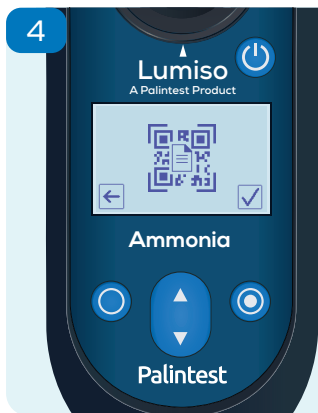
This is a reminder that you are looking at a stored result in the log.




The log of results can be downloaded as a text file via the USB port.


Alternatively, use the QR code function (see below).

Displaying a QR Code



It is possible to display the entire content of the Results Log as a QR code for scanning by other devices.

From the Settings Menu 

Select the QR code icon  and confirm

An alpha numeric, version 30, QR code will be displayed.


24 Changing Lumiso Settings



Setting Time and Date

Changes to the instrument settings are accessed through the Settings Menu.

1



From the Settings Menu 


Scroll to the Time and Date icon  and confirm 

2




Three items are adjustable:

- Date Format
- Time (24 hour clock)
- Date

To make changes to the highlighted item, use the up and down key 



 Advances to the next item


 Goes back to previous item

To exit without saving any changes press back  from this first screen.

3



To save changes, advance  until the tick  shows to confirm.



To exit without saving any changes keep pressing back 

Adjusting the Display Backlight

Lumiso's screen brightness is adjustable and there are five levels to choose from.


1



From the Settings Menu 
Select the light bulb icon 
and confirm

2





Use the up and down keys 
to adjust the brightness of
the screen as required.
Confirm to save the new
setting.
Press back to exit without
making any changes.

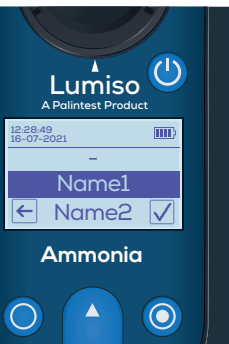
1




Sample readings can be tagged to indicate a sample name, project or sampling location.


In the settings menu  scroll to the tag icon  and confirm

2



Use the up and down keys  to highlight a name.

Select confirm and that name will then be used to label all future measurements until it is changed.

Press back  to leave the current label name unchanged.

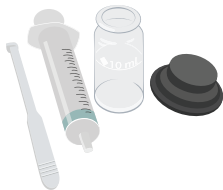
3



To set up a list of names, use the USB port to connect Lumiso to a PC and visit: www.palintest.com/palintestconnect

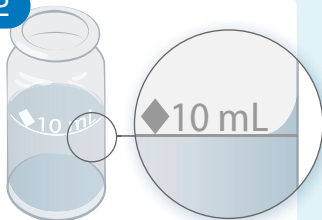
How to Get Accurate Results

1



Rinse all equipment thoroughly with the water that is being tested.

2



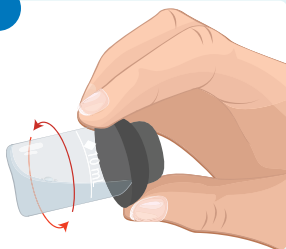
When filling tubes to the 10 mL line ensure the level is as shown

3



Use Palintest Tubetests or photometer reagents

4



During sample testing or blanking, remove any attached bubbles by capping the tube and rotating as shown.

5



Ensure tubes are dry on the outside before placing them in the instrument.

6



Ensure that your Lumiso Instrument is clean and dry. Place photometer tubes in the instrument with white diamond aligned to the mark on the instrument.

Blanking

Blanking is slightly different depending upon whether the test format is a tablet test or liquid Tubetest. See **“How to Select and Perform a Test”**

Blanking is not specifically mentioned in each test method but it is important that the instrument has been correctly “blanked” each time a test is carried out.

Sample Dilution



If a result is above the range of the test a ‘>’ symbol will appear in front of the result. In this case it will be necessary to dilute the sample with deionised water and repeat the test.



A dilution tube is available from Palintest to simplify this.

Example for a x2 dilution:
Fill with sample to x2 line and top up to 100 mL with deionised water. Mix and use this as the new blank and sample for the test. Multiply result by x2.

Depending upon model, any of the following tests may be present in the menu.

Name on Menu	Test Method	Reagent System	Range	Page
Nes 15N	Nessler	Liquid Tubetest (Ammonia/15N)	0 – 15 mg/L N	31
Nes 50N	Nessler	Liquid Tubetest (Ammonia/50N)	0 – 50 mg/L N	31
Nes 100N	Nessler	Liquid Tubetest (Ammonia/100N)	0 – 100 mg/L N	31
Ind 1N	Indophenol	Tablet (Ammonia API52)	0 – 1 mg/L N	36
Ind 12N	Indophenol	Liquid Tubetest (Ammonia/12/50N)	0 – 12 mg/L N	33
Ind 50N	Indophenol		0 – 50 mg/L N	33

All ammonia concentrations reported by Lumiso are in mg/L N

To convert to mg/L NH₄ multiply by 1.3

To convert to mg/L NH₃ multiply by 1.2

Ammonia (Nessler Tubetest Methods)

Name on Menu	Range	Sample Volume Used
Nes 15N	0 - 15 mg/L N	5 mL
Nes 50N	0 - 50 mg/L N	1 mL
Nes 100N	0 - 100 mg/L N	0.5 mL

Colour Change: Colourless to yellow to orange



1

Tubetests require use of adapter

Please see section **How to Select and Perform a Test** for details of Tubetests **Blanking**.

2

Remove Cap from Tubetest and add:

5 mL of sample for Ammonia **15N**
or **1 mL** of sample for Ammonia **50N**
or **0.5 mL** of sample for Ammonia **100N**



4

Add **12 Drops** of Nessler's Reagent




Replace cap securely and invert several times to mix

5



6

Wait 1 minute

Alternatively, to use the automatic timer, immediately place tube in the cell holder then press read 



7



Take the **Photometer Reading**.
Result = mg/L Ammonia (as N)

Ammonia (Indophenol Tubetest Method)

Name on Menu	Range	Sample Volume Used
Ind 12N	0 – 12 mg/L N	1 mL
Ind 50N	0 – 50 mg/L N	0.2 mL

Colour Change: Colourless to yellow to green



1

Tubetests require use of adapter

Please see section **How to Select and Perform a Test** for details of Tubetests **Blanking**.

2

Remove Cap from Tubetest and add:

1.0 mL of sample for Ammonia range 0-12 mg/L (**12N**)

or **0.2 mL** of sample for Ammonia (0-50mg/L) (**50N**)

Swirl tube to mix



3

Add **one** Tubetests
Ammonia (Indophenol)
Tablet.




4

Crush tablet and mix.
Then replace cap



5

Wait exactly 10 minutes
Alternatively, to use the
automatic timer, immediately
place tube in the cell holder
then press read 



6

Just prior to reading, invert tube once. (If tube is in cell holder then entire instrument can be inverted gently and returned to its normal position, just before the timer elapses)



7

Take the **Photometer Reading**.
Result = mg/L Ammonia (as N)

Please Note

The 10 minute waiting time needs to be measured precisely. Ignore colour change after this time.

Colour development time is temperature dependant and based on 20°C. Both Tubetests and sample should be as close to this as possible.

Indophenol Tubetests are sensitive to light, always keep the lid closed.

Ammonia (Tablet Method) Ind 1N**Colour Change:** Colourless to yellow to green**Range:** 0 – 1 mg/L**1**

Fill tube with sample to the **10mL** line.

**2**

Add **one Ammonia No 1** tablet and **one Ammonia No 2** tablet

3


Crush both tablets and stir to mix.





4

Wait 10 minutes

Alternatively, to use the automatic timer, immediately place tube in the cell holder then press read 

5

Take the **Photometer Reading**.

Result = mg/L Ammonia (as N)

**Seawater Samples**

Turbidity will form when testing seawater and invalidate the result.

Conditioning Reagent is available in a special pack with built in measuring spoon. Add 1 spoonful of this powder to the 10mL sample, and mix, prior to adding the two tablets. If turbidity still appears repeat the test using 2 spoonfuls of conditioning reagent.

38 Technical Specification

Instrument	Dual wavelength, direct-reading colorimeter
Results Log	50 results, with date, time and label
Optics	Palintest dual LED light source optical system with narrow band wavelength filters and photodetectors
Wavelengths	Automatic wavelength selection of 620 nm and 465 nm
Wavelength Tolerance	± 2 nm
Filter Bandwidth	5 nm
LCD Display	226 x 138 pixel with adjustable backlight
Instrument Operating Conditions	0 – 50°C 90% Relative Humidity (non-condensing)
Waterproof Rating	IP67 (Waterproof)
Test Cells	25 mm diameter tubes
Blank/Zero setting	Held in memory, but to maintain test accuracy, instrument will prompt for re-blanking after 50 minutes or if environmental temperature has changed.
Power Supply	3 x 1.5V AA batteries USB Port 6V max, 200mA max (DC)
USB Port	Micro USB Type B
Size	163 x 70 x 45 mm
Weight	275g (including batteries)

Please take care when changing the three AA/LR6 batteries in order to maintain the waterproof rating of the instrument.

1



To change the batteries, first disconnect the USB lead.

Then use a suitable screwdriver to loosen the captive screw

2

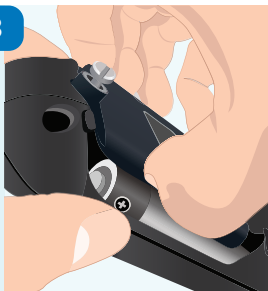


The watertight seal built into the battery cover means that a firm pulling force needs to be applied to remove it.

This is best done by gripping the sides of the cover, as shown, as close as possible to the end with the captive screw.

Please note: Levering the cover off with a screwdriver or sharp implement risks damaging the cover and seal.

3



The cover will lift and, if necessary, the captive screw can be further loosened so the cover can be removed completely.



4



The batteries are held firmly in place by the clips to enhance Lumiso's resilience to physical shock.

To remove the batteries, push them towards the negative contact and lift the positive end.

5



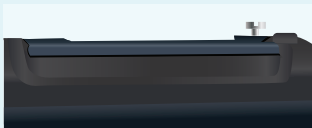
Insert new batteries in the same way, pushing towards the negative contact, but this time, down at the positive end.

Note the polarity guidance in the compartment.

6



Replace the cover, hinge end first. Then firmly push the cover down until it is parallel to the case as below. This ensures that the waterproof seal is complete.



7



Secure the captive screw so that it gently holds the cover in place.

Please Note: Do not tighten the screw excessively. The level of torque applied to this screw has no effect on the performance of the waterproof seal.

Thank you for choosing your Palintest Lumiso Photometer. For any further questions or information on Lumiso consumables and accessories please visit www.palintest.com

Palintest

Water Analysis Technologies

A **Halma** company

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