Palintest
Water Analysis Technologies

Kemio
Instruction Manual

About us

A rich history in innovation

Palintest are committed to making water analysis technologies simple and accessible.
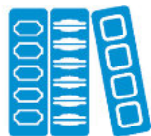
A global company with a local approach
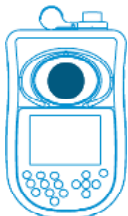
•USA   •UK   •China   •Australia

75 Years of research

Extensive online library, we are proud to share our research.

Instrumental

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

Contents

Introduction

Kemio is a measurement and data platform for chemical testing. It is used by utilities and municipalities for drinking water, for water testing in the F&B sector, and other industrial, scientific and service applications. The data is used in reports for audits, records, quality control, process control, and trend analysis.

Kemio offers varied benefits to users:

- Reliable, high quality results with little risk of user error
- Traceable data record of 10000+ results
- Data enrichment with application and test information
- IP67 certified with waterproof micro USB port

Safety Information

Please read the entire manual prior to setting up or operating this equipment.

To achieve the performance specified in this manual, only use this instrument in the manner specified below. The instrument is IP67 certified, including the USB port. However, it is recommended that the Kemio Platform is clean and dry before use.

Review the 'Care and Maintenance' section for recommendations on best practice.
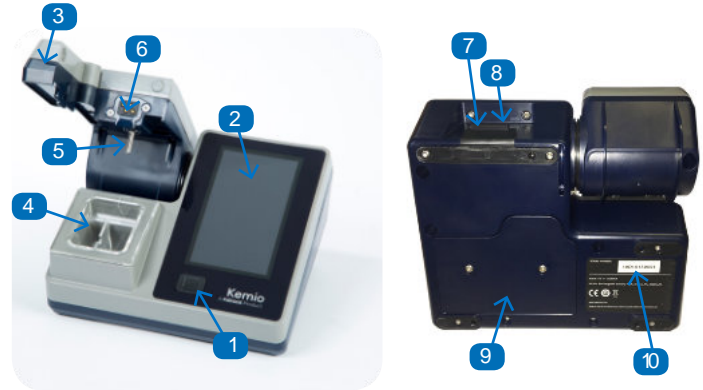
Product Overview

1	Power	6	Electrical contacts
2	Touch screen	7	Barcode scanner
3	Testing Arm	8	Micro USB port
4	Sample vessel	9	Rechargeable battery
5	Temperature probe	10	Serial Number

Press the power button and release. An audible beep will confirm the instrument is on. Switch off by holding the power button for 2 seconds.

Kit Contents

Kemio comes in one of 3 kit formats:

Benchtop kit

The benchtop kit is perfect for static applications, where Kemio will remain in the same location and doesn't require any transportation.

The benchtop kit contains:
- Kemio Disinfection
- USB cable and international adaptor
- Fitted cardboard box

Soft kit

The soft kit is perfect for most mobile applications. The kit has space for spare sensors and accessories. The Kemio sleeve protects the instrument and provides a mobile test platform.

The soft kit contains:
- Kemio Disinfection
- USB cable and international adaptor
- Palintest soft carry case
- Kemio protective sleeve

Chlorite hard case kit

Testing for Chlorite requires additional accessories and reagents. These are included in the engineer's kit, which serves as a Chlorite starter pack. It provides protection for the instrument and equipment, and contains all the elements required for Chlorite testing.

The chlorite hard case kit contains:

- Kemio Disinfection
- USB cable and international adaptor
- Sensors and reagents for chlorite test
- Degassing equipment
- Extra batteries
- Palintest hard case

Kemio kits do not include sensors by default. A sensor refill pack must be purchased to perform tests

Kemio gives direct, on-screen visual instructions to assist with each test workflow. Follow these steps for best performance. For more details and instructions for each test type. Download the Kemio test instructions at www.palintest.com

Palintest
Water Analysis Technologies

Kemio
Test instructions

From the home screen, press HISTORY to view Kemio's historic test results from newest to oldest.
Up to 1000 results can be viewed directly on the device.

Results can be filtered using several methods:

All Tests	No filter. Show all test results.
Test Types	Show results filtered by test type
Labels	Show results filtered by label
Users	Show results filtered by user
Passed	Show tests with results within label limits
Failed	Show tests with results outside label limits and void tests.

Select a filter to view the results summary. 25 results are displayed on a page.
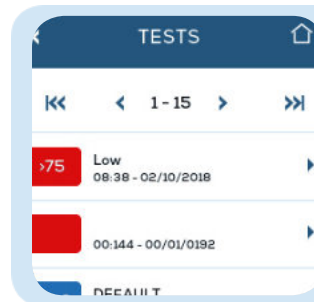
Use the < and > buttons on the navigation bar to view the next set of 25 results. Use the |<< and >>| keys to jump to the first and last test results.

Kemio can be personalized to suit specific testing needs:

- Enrich data to give meaning to test results
- Enable decision-making with clear pass/ fail results
- Help control processes
- Integrate into quality systems
- Provide a clear, traceable audit trail.

Data enrichment

Tagging additional information to test results is useful in applications that require reporting, performance improvement, monitoring, and where instruments are used in a variety of locations or to measure multiple parameters.

With all this information available over USB, the test does not simply deliver a number on a screen, but gives context to each result.

Label

Labels are used to tag each test as one of a pre-defined set. If labels are used, they should span all possible test types.

Examples of label sets include:

- Types of produce in a vegetable processing facility (carrots, lettuce, spinach)

- Production lines in a bottling plant (line 1, line 2, line 3)

- sampling points in a building (Room 202, Room 313, Plant, Reception)

- Different parts of a process (pre-tank/ post-tank)

- Water sample types with different qualities (Type A, Type B, Type C)

- Use a generic DEFAULT or OTHER label for miscellaneous tests.

User

Create a user profile on the device for each person who will perform tests. If other people will also perform tests less frequently, consider creating a DEFAULT or OTHER user.

Reference codes

Reference codes are application-specific tags for a type of measurement. Examples include:

- Sample points
- Location IDs
- Work orders
- Batches
- Variety of test
- etc.

This information can be tagged directly to each test result from a printed barcode on paperwork, a barcode on a label, a specially printed and laminated barcode, etc.
To generate a barcode, use an online barcode generator. Standard barcode formats include UPC, EAN, Code 39, Code 128, Code 93, Codabar, etc. All will be interpreted by the barcode scanner. Type in the code. Print the code on paper or a label or display it on a screen.

Barcodes for Kemio can be a maximum of 15 characters, using the characters available on the Kemio keyboard. If Kemio scans a character from outside the set, it simply will not be stored in memory.

Notes

The Notes field can be used to suit any application need. It can be structured as desired: to give contextual information, environmental information, equipment details, a report on corrective action taken, etc.

Traceability

For high-risk applications that are audited or closely monitored, Kemio offers the following options to improve traceability.

Users to improve accountability

By using Kemio to tag the name of the user performing the test to each test result.

Batch code scanning

To ensure that the correct batch information for each sensor is used on each test by forcing the user to scan each sensor before use.

Limits and Pass/Fail results

To correlate with corrective action. By using labels with limits,
each test will either be a PASS or a FAIL. Every out-of-spec
result (FAIL) should have some corrective action. Failed
results can be monitored using the test history (p. 6) to
ensure that the process is being followed correctly.

Process control

Actionable results

If a measurement is tagged with a label that has limits
set, the result will be presented as a PASS or a FAIL.

In the event of a PASS, the user can be confident in their
water quality. No action must be taken.

If the result is a FAIL, then the user must take some further
action. Kemio enables rapid decision making.

Once this action is taken, this and/or the root cause of the
problem can be documented in the Notes section of the
test and tagged to the FAIL result for future reference.

Dilution

Kemio corrects for dilution factors automatically. The
displayed result is calculated according to the dilution factor
which is programmed into the label, eliminating the need for
the user to do any calculation.

Simple configuration

For straightforward applications where little variance is expected, Kemio can be configured in the simplest way to reduce the number of steps for the user. This provides the most direct route to a result.

Test types

Select a single target test parameter and unselect all the others.

Labels, limits and users

Disable tagging labels, users and reference codes.

When performing a test, Kemio will not prompt for a label or user. After the test, the SCAN REFERENCE button will not appear. In the log file, the label and user will always be DEFAULT, and the limits and reference fields will be blank.

A second option is to delete all the user-generated labels and users. Kemio will not ask for a label or user. In the log f le, the label and user will always be DEFAULT.

A third option is to keep Labels and Users selected, and set exactly one label (with limits, if desired) and user. Since there is only one choice, Kemio will automatically select it and display it in the log.

Barcode scanning

Reduce the frequency of scanning sensor barcodes Configure Kemio to scan the sensor batch only the first test after Kemio is turned on. Or configure Kemio to prompt users to select the batch from a list on the screen instead of scanning.
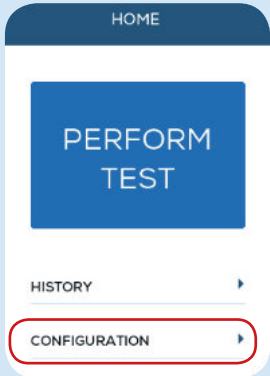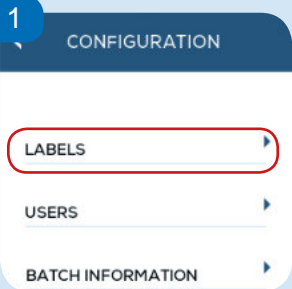
Configure the Kemio instrument settings and test settings.

Select CONFIGURATION from the home page to access the CONFIGURATION menu.

Labels

See the "Why Configure Kemio" section for details on how labels can be used in application for enriching data (p.7), traceability (p.10) and process control (p.12).

Add a label

1

Select LABELS from the CONFIGURATION menu.

2
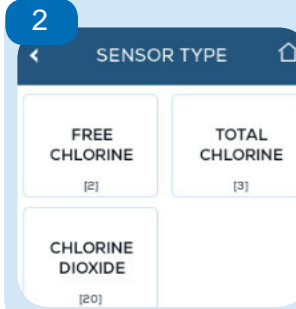
Select the appropriate test type name from the list.

Labels and limits apply to one specific test type. If a test or sensor produces more than one result, the label will only apply to the test type selected here.

If the desired test type is not available on the list, use the select test instructions on p. 25.

3
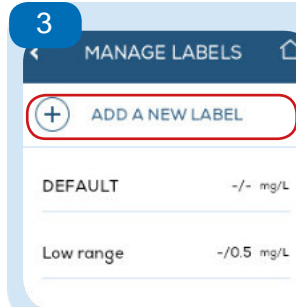
Press ADD A NEW LABEL.

Choose a descriptive name for the label. Label names are unique for a test type, but labels for different test types can share the same name.

4

Sample ✕

+ LOWER LIMIT   + UPPER LIMIT

+ DILUTION

Add a lower limit and/or upper limit to set the range that is considered a PASS for the test application.

If a sample measured using this label has a concentration outside of this range, it will be tagged as a FAIL.

5

If the process requires dilution to bring the measured sample within Kemio's measurement range, use a dilution factor. If no dilution is required, the field can be left blank. If 1 or 0 is entered for dilution, the label will display "- X" and no multiplication will be performed.

The displayed test result is calculated using the dilution factor programmed into the label.

For example:
A 100 mg/L sample needs diluting 4X. 1 part of sample is diluted with 3 parts of deionized water. When a test is performed using this label, the instrument will read 25 mg/L. Using the dilution factor, 100 mg/L will be displayed on the results screen.

Limits are applied to the calculated result. Press SAVE to save the label in memory.

When configuring the label, if the test limits after dividing by the dilution factor do not fall within the sensor method test range, an error is displayed, and the label will not close or save.

If multiple labels are set for a test type, the user must select between them when performing a test. If a single label is set, Kemio will automatically select it during a test. If no labels are set, the label will be DEFAULT.

Edit a label

Sample ✕

2   5
LOWER LIMIT   UPPER LIMIT

X 1
DILUTION

SAVE

Select the label from the list. Click on the number to be changed. Enter a new number and press SET or press X to cancel.

Label names cannot be edited. Create a new label instead.

Delete a label

🗑 Sa

Select the label from the list. Press the 🗑 button.

The label is deleted from memory. Previous tests will still be tagged with that label.

Users

See the "Why Configure Kemio" section for details on how users can be used in application for enriching data (p.7) and traceability (p.10).
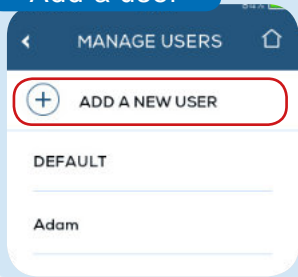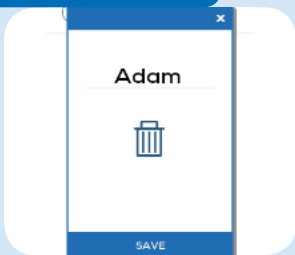
Add a user

Select USERS from the CONFIGURATION menu.

Press ADD A NEW USER, Type the user's name,

Press SET to save the user in memory.

If multiple users are set, the user must select between them when performing a test. If a single user is set, Kemio will automatically select it during a test. If no users are user will be DEFAULT.

Delete a user

Select the user from the list. Press the 🗑 button. The user is deleted from memory. Previous tests will still be tagged with that user.

Users cannot be edited.

Add batch information for each new batch of sensors to Kemio's memory. Once the batch is in memory, the sensor can be used for testing.

See p.31 for details about what batch information is and why it is important for result accuracy.

Add a batch

1

Select BATCH INFORMATION from the CONFIGURATION menu.

2
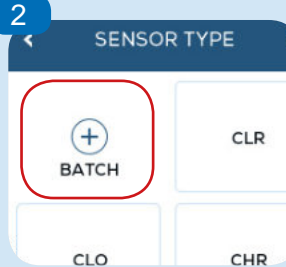
Press the (+) BATCH button.
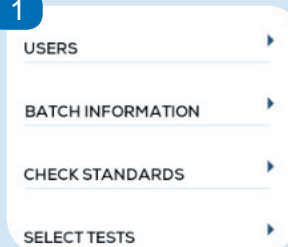
3

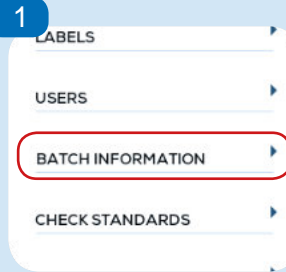Scan the QR code on the side of the box of sensors. Details about the batch appear in a pop up on screen, and is automatically sorted into the correct folder. If a batch is added as a duplicate, the "loaded on" date will update but nothing else will change.

1

USERS ▶
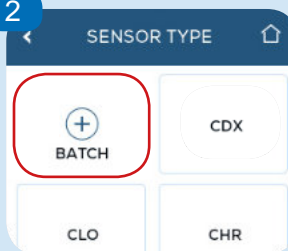
BATCH INFORMATION ▶

CHECK STANDARDS ▶

SELECT TESTS ▶

Select BATCH INFORMATION from the CONFIGURATION menu.

2

SENSOR TYPE ⌂

⊕ BATCH

CDX

CLO

CHR

Select the sensor type code from the list. The code is also the start of the batch code and can be found on the foil packaging or box.

3

CHLORINE ML ⌂

⊕ BATCH

CLO071803
Expiry Date
07/2020

Select the desired batch to open a popup with details.

A maximum of 100 calibrations can be stored on the device. They are sorted by sensor type.

Check Standards

Kemio is supplied with check standards (KEMC10) to conf rm the instrument is working correctly.

Validating Kemio using Check Standards

1

BATCH INFORMATION ▶

CHECK STANDARDS ▶

SELECT TESTS ▶

SETTINGS ▶

SELECT TEST ⌂

CHECK STANDARD | FREE CHLORINE

TOTAL CHLORINE | CHLORINE DIOXIDE
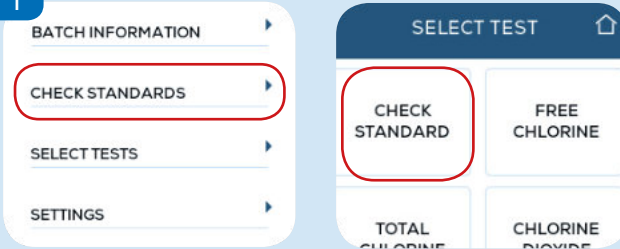
Start a check standard test by
A) pressing CONFIGURATION then CHECK STANDARDS
or
B) pressing PERFORM TEST or open the arm, and selecting CHECK STANDARDS
(Check standards must be enabled as a test type.)

2

Open the arm, and Insert the first of four check standards from the KEMC10 pack.

3

2018   14:30   100%

◄ CHECK STANDARDS ⌂

PASS

STANDARDS1

STANDARDS2

STANDARDS3

STANDARDS4

STANDARD S1
SUCCESSFUL
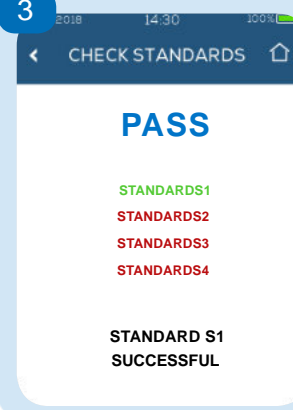
The check takes 10 seconds. If the instrument is functioning correctly, a PASS will display on screen and the corresponding line will turn green.

If Kemio displays a FAIL, repeat the test with the same standard. If the problem persists, contact your Palintest representative.

4

◄ CHECK STANDARDS ⌂

PASS

STANDARDS1

STANDARDS2

STANDARDS3

STANDARDS4

STANDARD S1
SUCCESSFUL
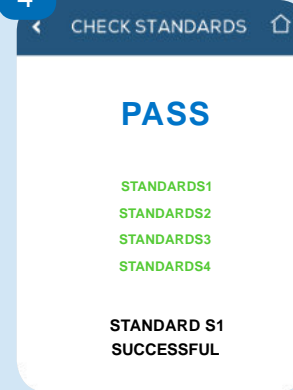
Press NEXT or open the arm to test the next standard. Repeat with each standard in this way. If all standards pass, Kemio will display a summary report and return to the home screen.

Results are stored in the data log for traceability.

Select Tests

Kemio can perform multiple test types. Select which test types will be accessible using the SELECT TESTS function. Test types that are not selected will not appear elsewhere on the instrument.

If a single test type is selected, all test selection screens are skipped, and this test type will be automatically chosen.

How to select tests

1
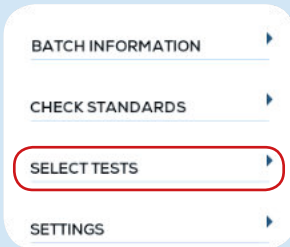
Select SELECT TESTS on the CONFIGURATION menu.

2a
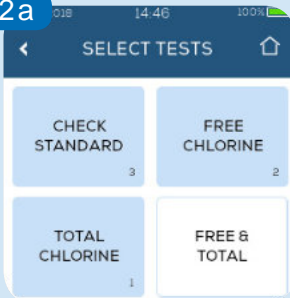
Highlight test types by pressing them. A number appears in the bottom right corner. The number represents the order in which they appear on test selection screens....
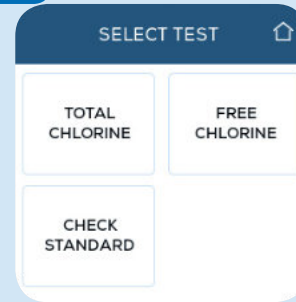
For example, these three selections appear on other screens like this.

3

Press the back button to return to the CONFIGURATION menu. It is impossible to navigate away from the screen without at least one test type selected.

The check standard test is a selectable test type. It can also be accessed from the CONFIGURATION menu. If only one test type is used, it is recommended to un select check standards as a test type and remove the additional test selection step.

Select SETTINGS from the CONFIGURATION menu.

Date format

Set the date format (dd/mm/yyyy or mm/dd/yyyy) by pressing DATE FORMAT and then pressing the desired format and pressing the back button.

Date

Set the date by pressing DATE, entering the correct date using the number pad and pressing SET.

Time

Set the time by pressing TIME, entering the correct time using the number pad and pressing SET.

Language

Set the display language by pressing LANGUAGE, then pressing the desired option and pressing the back button.

Units

Set the instrument display units by pressing UNITS, then pressing the desired option and pressing the back button.

Select whether to enable or disable certain data enrichment and traceability steps from the test procedure.

User

Select whether to enable or disable certain data enrichment and traceability steps from the test procedure.

Labels

Set whether the SELECT LABEL screen appears at the start of a test. If this is switched off, the label tagged to the result will be DEFAULT and there will be no limits or dilution applied to the test. This means that the results screen will always be a blue RESULT rather than a PASS or FAIL.

Reference

Set whether the SCAN REFERENCE button appears on the Details page at the end of the test. If scanning a code is a part of the workflow, set this switch on. If there is never a code to attach to results, set this switch to off.

Scanner Settings

Kemio's barcode scanner ensures that the right sensor type is used for a test, that the right calibration information is used, and that the sensor is in date.

If an incorrect barcode is scanned, the instrument displays an error screen with advice on how to correct the problem and proceed with the test.

If the wrong batch code or sensor is used, it could produce an incorrect result.

• Scan every test. Each time Perform Test is pressed, Kemio will prompt the user to scan the sensor barcode. Select this option for total traceability.

• First test only. After powering on, the first test of a test type will be scanned. Until the instrument is turned off, Kemio will skip the prompt to scan a sensor.

• Manual entry. Select the correct code from the list on screen.

Details

Press DETAILS to view instrument details. This information is used for troubleshooting problems.
• Instrument Serial Number
• Main Firmware Revision
• Bootloader Firmware Revision
• Gauge Firmware Revision
• Date of Manufacture
• System Calibration Date
• Hardware Revision
• Total Number of Tests Performed

Batch Information

Kemio uses an electrochemical method with disposable screen-printed and dosed sensors to measure chemicals in solution. The single-use sensors produced in a single batch all have the same performance characteristics

Calibration of each sensor batch is performed by Palintest during production and the information is provided with the sensors in the form of a QR code on the box.

The correct batch information must be used with a sensor. If a sensor uses calibration information from the wrong batch, it could produce a less accurate result. Kemio protects against this possibility by encouraging the user to scan the batch code to access the correct calibration batch for each test. If this option is disabled, it introduces a possible user error.

Kemio is supplied with check standards (KEMC10) to confirm the instrument is working correctly.

Kemio sensors produce an electric signal when used with Kemio. Kemio measures that electric signal and displays the corresponding concentration. The check standards produce standard electric currents. If Kemio is able to measure the expected signals from the check standards, then it is performing correctly.

If the measured signal does not match the expected values, either the check standard was used incorrectly or there is a problem with Kemio. Repeat the test, and then contact your Palinteest representative at sales@palintest.com.

Transferring Data

The data log and individual result record can be extracted from Kemio over USB.

1 Plug the powered down Kemio in to the PC using the micro-USB port

2 Power on Kemio. A window will appear on the PC.

3 Navigate to: Computer\Kemio Water Quality Tester\ System to view the TestLog.txt.

4 Navigate to: Computer\Kemio Water Quality Tester\ Test Results to view individual result f les.

Additional software is required to decrypt and view the files.

Data Log

The data log is a record of the over 10000 test results and information. Each line represents a separate test result. A test that produces multiple results is stored in the data log under multiple lines.

The result log can easily be imported into analysis tools, such as excel. Each line includes data in tab-separated columns that represent the following information about each test:

- User
- Label
- Sensor Batch
- Sample Temperature

- Test Parameter
- Dilution Factor
- Unit of Measure
- Chemical Species

- Result
- Reference

Individual Result Record

1000 test records are stored as encrypted files.
A test with multiple results produces multiple encrypted records. They can be viewed only using decryption software. There is always an encrypted backup of logged results, ensuring full traceability and data integrity for the result log.

Software upgrade

Kemio is an evolving measurement platform. Keep it up to date with the latest features, bug fixes, test types, etc. by installing the latest software.

1 Download the latest version of software from the Palintest website at **www.palintest.com**

2 Connect Kemio to a PC via USB.

3 Open the file folder. Drag the .kfwu file into the top level of the file folder.

4 Do not interrupt the file transfer. Wait during the upgrade. The instrument will display a white hourglass icon.

5 When the upgrade is complete, Kemio displays a green hourglass icon and returns to the neutral powered-off screen. The file folder refreshes on the PC.

Loading the new software does not affect historic data or configuration information. The platform is forwards and backwards compatible, so any software version can be loaded.

Batch information over USB

If a sensor batch QR code is lost or becomes damaged, or if the scanner is malfunctioning, the batch information can be loaded onto the instrument over USB.

1 Request the calibration file from sales@palintest.com

2 Connect Kemio to a PC via USB.

3 Open the file folder. Drag the batch information file into the top level of the folder.

4 The batch information will be loaded, and the sensors will produce accurate results.

Downloading On-Screen Image

When troubleshooting with technical support, copy a screen-grab of the instrument for greater clarity.

1 Connect Kemio to a PC via USB.

2 Navigate to the System folder and open Kemio Screen.bmp

3 Copy the image. Paste it into another document

Kemio

Kemio is IP67 rated, however the electrical contacts inside the front lid must be dry during testing. Open the front lid of the arm and wipe the contacts with a dry lint-free cloth to remove any moisture before inserting a sensor.

The touch interface is functional with droplets on the screen but responds best when dry.

To maximize battery life, use deep charge cycles: use the battery until it is very low before charging to 100%.

Kemio is an analytical instrument. Although it was designed to perform in difficult application evironments, it is still a precise measurement instrument. Do not handle roughly. Do not drop the instrument or strike it with an object.

Kemio should be kept clean to ensure it is free from bacteria and there are no interferences from contamination when conducting measurements. Best practice is to use a dry and absorbent cloth to remove any excess fluids or spillages from the instrument as they occur.

Alcohol wipes can be used to clean the instrument if required.

Store Kemio in a cool, dry location.

Sample Vessel

Rinse sample vessel before use with sample, and rinse after use with deionized water to prevent cross contamination.

Remove and empty the sample vessel after testing. Do not leave sample water or sensors in the instrument as bacteria could form.

Sensors

Do not handle or store sensors roughly in their packaging. Do not touch the surface of the electrodes where the chemicals are dosed, as this will affect the measurement result.

Sensors are single use. They can be disposed of with normal waste.

If keeping sensors for over 1 year, store them in a refrigerator to ensure they reach their expiration date.

Check Standards

Keep check standards clean and dry.

Check standards should not be used after their stated expiry date. Replacement sets of KEMC10 are available for purchase.

Degassing Equipment

The degassing equipment consists of a base and cup with a porous filter and O-ring in the middle.

The degassing equipment comes as a single assembly, but can be disassembled, and parts reordered if they require replacement.

The filters do not have a shelf life as the longevity of the component will be dictated by the test samples being used with the degasser.

Replace degasser filter

1. Release the cup from the base by gently twisting the cup anti-clockwise.

2. Remove the old filter disc and place the new one in the base of the degasser with the red ring facing upward.

3. Place the O-ring seal in the cup. Press the seal into the groove situated on the bottom of the cup.

4. Replace the cup onto the base and gently twist the cup clockwise.

5. Test the seal prior to use on a real sample.

6. Connect the tube from the pump to the underside of the degasser base.

Battery Information

Kemio is supplied with a rechargeable NiMH battery pack that provide power for approximately 250 tests per charge and approximately 500 charge cycles, for a total of approximately 125,000 tests before a battery change is required.

To save power, the instrument will dim the screen after 1 minute and shut down after 2 minutes of inactivity. An indication of the remaining battery life is displayed on the screen with the battery status icon. When the battery life is too low to perform a test, the unit will automatically shut down until charged to a suitable level.

Charge Kemio using the supplied external charger or a standard USB connection. The battery charging system provides a controlled charge current based on the state of the battery and the power source.

To maximize battery health of a new Kemio instrument, it is recommended to drain the battery completely and then charge it to 100% three times to condition the battery management system.

The battery pack should only be replaced at a Palintest Service Centre. Please contact: sales@palintest.com for details.

Warranty

Kemio has a two-year warranty from the date of purchase. The first year is standard. To activate the second year of warranty, register the instrument online at www.palintest.com/en/product-registration .

Troubleshooting

Kemio raises warnings and errors to ensure testing is done correctly and results are accurate. If an error that is not on this list persists, contact sales@palintest.com.

Error	Cause	Action
Invalid Barcode	A barcode has been scanned but it does not match the Kemio barcode format	Scan the correct barcode type
Invalid Sensor Type	A Kemio sensor has been scanned, but it does not match the selected test and limits	Scan a barcode from a suitable sensor batch
Invalid Batch	The batch information has not been loaded for this sensor	Add the batch under CONFIGRATION › BATCH INFOR-MATION to load the calibration information.
No barcode found	The scanner was unable to detect the barcode	Add the batch under CONFIGRA-TION › BATCH INFORMATION to load the calibration information.
User aborted	User pressed cancel or home during the test	Repeat the test with a new sensor and do not interrupt the test
Lid opened during test	The user opened the arm during the electrochemical measurement	Repeat the test with a new sensor
No electrode	No sensor was detected during the test	Repeat the test with a new sensor. Ensure the sensor is fully inserted into the slot.

Error	Cause	Action
Instrument rolled	Excessive vibration or impact was detected	Repeat the test on a stable surface. Avoid moving the instrument during the test.
Outside temperature spec	The sample temperature is outside the specified performance of the sensor. A result is still displayed but it may be less accurate.	Bring the sample to within the specified temperature before testing
Start up electrode leakage	A Sensor contacts are wet B A sensor was left in the instrument during start up	A Open the front lid of the arm and wipe the contacts with a dry cloth. B Discard the sensor and sample after testing, before powering down the instrument.
No test selected	All test types unselected	Select at least one test type.

Technical Support

For technical support please contact:

sales@palintest.com

or

Palintest Ltd
Palintest House,
Kingsway,
Team Valley,
Gateshead,
Tyne and Wear,
NE110NS,
UK

http:// www.palintest.com

Reorder Codes

Kits	Product Code
Kemio Disinfection Soft Kit	KEMS10DIS
Kemio Disinfection Benchtop Kit	KEMR10DIS
Kemio Disinfection Chlorite Hard Case Kit	KEMH10DIS

Accessories	Product Code
Kemio Check Standards	KEMC10
Degassing Equipment Set	PT553
Replacement Filter (Degassing Equipment)	PT556
Pump set (Degassing Equipment)	PT554
Replacement O-Rings (Degassing Equipment)	129-13
Kemio Stylus	KEM306
Replacement Vessel	145-017

Technical Specif cation

Measuring System	Chronoamperometry
Range	0.02 – 25 mg/L free chlorine 0.05 – 500 mg/L total chlorine 0.02 – 50 mg/L chlorine dioxide 0.02 – 50 mg/L chlorite 5 – 2000 mg/L peracetic acid
Temperature range	Ambient range: 0 °C - 50 °C
Display	High clarity LCD screen
User Interface	Touch Screen
Language Options	English, French, Spanish and Mandarin
Connectivity	USB
Information input	Barcode scanner, on-screen keyboard, on-screen keypad
Data Storage	Viewed on device: 1000 results with all test information Downloaded to PC: 10000+ results in data log
Size (W x L x H) Weight	156 mm x 180 mm x 95 mm, 1012g
Battery	2300mAh NiMH Rechargeable Battery Pack. Only Battery Packs supplied or provided by Palintest are to be used with Kemio.
Power Supply	Supplied External Charger: Input: 100–240 V / 50–60 Hz / 160—80mA Output: 5V DC / 1500mA USB Power: USB Low Power Device: 5V DC / 100 mA USB High Power Device: 5V DC / 500 mA
Rating	IP67 waterproof