



User Guide 9.71301.0026EN Rev A

HY-LiTE[®] 2 System

Operating Instructions Manual

- Introduction on ATP testing
- Instrument and software settings
- Performing an ATP measurement

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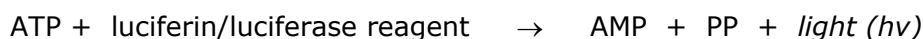
1 Introduction

What is ATP?

Adenosine triphosphate (ATP) is a substance found in all biomass, consisting of animal, vegetable and microbial matter.

Levels of ATP can be measured, to indicate the amount of such matter on surfaces or in aqueous or other samples.

The HY-LiTE[®] 2 system allows an accurate determination of the quantity of ATP present, by precisely measuring the light released in a highly specific biochemical reaction:



The intensity of the light emitted from a sample measured in the HY-LiTE[®] 2 luminometer is indicated on the display in relative light units (RLU). The RLU value is directly proportional to the quantity of ATP in the sample tested and therefore also directly proportional to the contamination with biological material.

ATP monitoring

The system consists of prefabricated and matched "Test Pens" that optimize the overall performance of the HY-LiTE[®] 2 luminometer. The HY-LiTE[®] 2 system is still the market standard, is very easy to operate, and can be used easily by anyone with minimal training. It has built-in temperature compensation as well as a unique power on self-test (POST) that ensures the instrument is calibrated prior to use to ensure the highest precision and comparability of the test results.

By use of the patented HY-LiTE[®] 2 pens, test results can be obtained in the shortest possible time. The measurement in the luminometer takes only around 15 seconds.

Evaluation of the measured values

The level of ATP that is acceptable or unacceptable in a sample is dependent on many factors. First and foremost, the type of sample and environment, e.g. hygiene monitoring of surfaces or CIP¹ rinse water in the food industry, biomass in process water, biomass contamination in fuel etc. Secondly, the types of raw materials, processes applied, material of the surfaces tested, and the "risk" associated with the product or process. Lastly, the reason for testing, e.g. routine monitoring, stop/go release testing or trouble-shooting.

Absolute standards for "Pass and Fail" limits therefore do not exist, but recommendations for limits can be provided: Merck and its distributors worldwide do have Application Notes available upon request for different applications of ATP monitoring.

The special TREND 2 data analysis software is now provided on a USB stick and is included with the HY-LiTE[®] 2 system to provide assistance. This package will calculate medians and other statistical values of use in limit setting.

The software is supplied with extensive help files and a series of self-study tutorials, which will guide the user step-by-step through setup and use of the instrument, software, data analysis and for example the limit setting.

¹ See Chapter 15 for a list of abbreviations.



Documentation of the results

Today, increasing requirements are made on secure documentation of the results. The HY-LiTE® 2 system is well equipped for this and is already prepared to fulfil such requirements.

The documentation encompasses the storage of all relevant data, such as date, time, user, serial number of the instrument, measuring point / sample number, result and interpretation of the measured value.

The data are stored in the HY-LiTE® 2 system and can be retrieved, printed or transferred to a PC as required.

With the PC, the data can be processed with the high-performance and advanced TREND 2 software for immediate transformation into graphs and tables. Additional data such as the batch of the applied pen etc. can be stored here, authentically and secure from falsification.



2 Safety Information

The HY-LiTE® 2 instrument

The HY-LiTE® 2 system operates at high voltages. The instrument must not be used if any section of the casing is cracked or detached. Ensure that liquids never enter the interior of the instrument.

Do not open the casing. There are no user serviceable parts within.

The warranty is void if the casing is opened by the user or if the "warranty void" label is removed or damaged.



The instrument may only be operated with the power supply unit included as part of the HY-LiTE® 2 system or with the batteries specified in Chapter 4.

The lid covering the pen measuring chamber should never be opened manually. It opens automatically after instrument self-check and after each measurement cycle. Opening the lid during the measurement cycle will cause the instrument to abort the measurement cycle and may cause damage to the lid mechanism.

The HY-LiTE® 2 system is not explosion proof. Do not use in the vicinity of flammable liquids unless the ventilation or is adequate atmospheres containing flammable gasses.

Maintenance and repair

All maintenance work should be performed exclusively by personnel who have been trained and certified by Merck.

If error messages occur, please refer to the instructions displayed on the screen. If malfunctions occur repeatedly, please inform your dealer or Merck.

Further information on error messages, cleaning and storage conditions are to be found in Chapter 14.

HY-LiTE® 2 test pens

Please observe the instruction sheet enclosed with the refill packs and pens.

The reagents contained inside present no hazard. However, in case of accidental leakage, as with any chemical, care should be taken to prevent contact with skin or eyes. In this case, the skin or eyes must be immediately washed or rinsed with water. Refer to the product safety data sheet for further information.

HY-LiTE® 2 pens and swabs can be disposed of as normal waste after use.



3 HY-LiTE® 2 System and Consumables

HY-LiTE® 2 System: Article 1.30100.0001

Every instrument is supplied with the following items:

Item	Qty
HY-LiTE® 2 luminometer	1
Quality assurance certificate and test report	1
A/C Power Supply (110-240V) and adapters for international use	1
Battery Holder (Requires 4 x AA batteries. Batteries not included).	1
USB stick with TREND 2 software for Windows O/S PCs (Win10 supported) and user manuals.	1
USB cable for TREND 2 data synchronization	1
Robust carrying case with shoulder strap	1

In addition, several additional HY-LiTE® 2 accessories are also available to order as separate items.



HY-LiTE® consumables:

Article No.	Description	No. of Tests
1.30101	HY-LiTE® 2 Surface test pens and hygiene swabs	100 pens 100 swabs
1.30102	HY-LiTE® 2 Liquid test pens for measuring "Total ATP" in CIP (Cleaning In Place) rinse waters or other liquid samples	50 pens
1.30194	HY-LiTE® 2 Liquid test pens for measuring "Free ATP" in CIP (Cleaning In Place) rinse waters or other liquid samples	50 pens
1.30196	HY-LiTE® 2 Jet A1 Fuel Test Kit, for testing biomass in fuel samples	20 Jet A1 Fuel pens 20 large pipettes 20 small pipettes
1.30895	HY-LiTE® 2 Plus ATP Test for industrial microbiology	20 pens 20 pipettes

Further consumables on request:

Article No.	Description	No. of Tests
1.30103	HY-LiTE® 2 Hygiene Swabs with Dacron® tip	50 sterile swabs
1.30104	HY-LiTE® 2 Rinse solution	50 vials
1.30195	HY-LiTE® 2 ATP Standard, 1.0 ng/mL, for positive control to verify performance of instruments and pens.	5 vials



4 Power Supply

Power Supply

BEFORE SWITCHING INSTRUMENT ON:

- Ensure correct A/C power connection of the instrument or insert the batteries required for portable operation of the instrument.
- Ensure the instrument is properly connected to the A/C power supply or that the battery holder and batteries are securely in place in the rear of the instrument (See "Battery Operation" below).

AFTER SWITCHING INSTRUMENT OFF, wait 5 seconds after the last screen has disappeared before removing the battery pack or the A/C power connector to ensure that the instrument has reset correctly.



*When A/C power (or battery) is removed from the instrument for more than 5 minutes, the Date and Time **MUST** be reprogrammed.*

A/C power connection

A/C power operation of the HY-LiTE® 2 luminometer can only be carried out by using the enclosed A/C power supply unit. The enclosed adapters make connection possible to nearly all international power outlets. Select the appropriate adapter for your country and fit it onto the power supply unit. The small adapter is for connection into the socket located on the rear of the instrument.



Battery operation

Four (4) commonly available sealed batteries (size AA, LR6, Mignon) can be used to power the unit for portable operation.

Batteries (not included): **Are printers included?**

When sealed, high-quality alkaline batteries are used, up to **600 tests with printer output** or 800 tests without printer output can be performed under normal operation.

Battery change

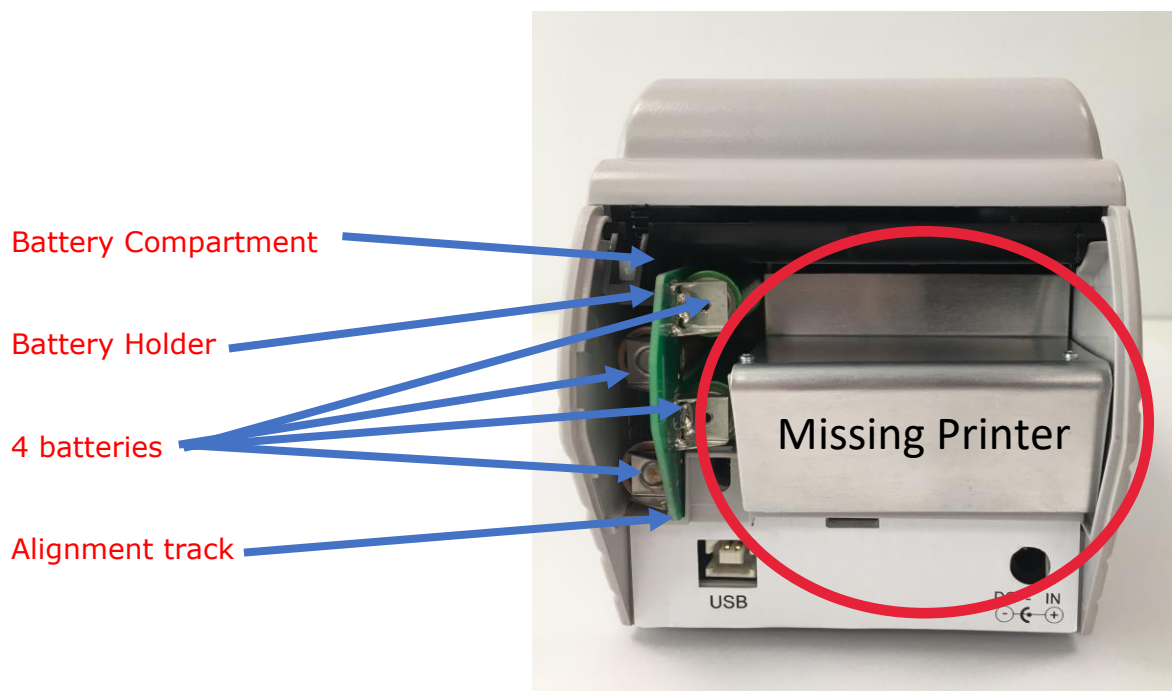
When the instrument display indicates a low battery by a warning message on the screen, the batteries should be changed without delay (or switch the instrument to A/C power supply).

To retain the date and time setting, connect the unit to A/C power supply **before** removing and replacing the batteries. Make sure the instrument is switched off. Open the battery cover and pull the battery holder out of the battery compartment. Insert a set of new batteries, following the polarity as indicated on the battery holder. If batteries are incorrectly inserted, the HY-LiTE[®] 2 system will be protected from damage by a protective circuit, but the instrument will not power up.

To insert the battery holder into the battery compartment, remove the rear cover plate, insert the holder into the track and gently push the battery holder into the unit until it clicks.

If no new batteries are available, the instrument should be connected to A/C power to avoid having to reset the clock.

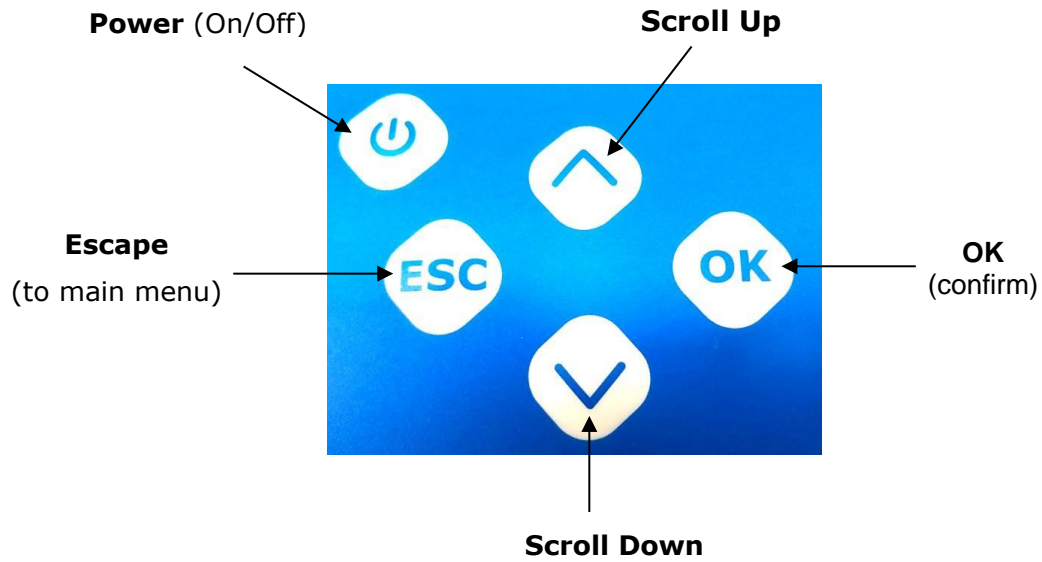
If you use the instrument on A/C power and after you remove the battery support, make sure to remove the batteries from the support, otherwise it can be damaged.



5 Controls

Control buttons

The HY-LiTE® 2 system is very easy and simple to operate using only 5 buttons (four in a large operating panel and a separate on/off button):



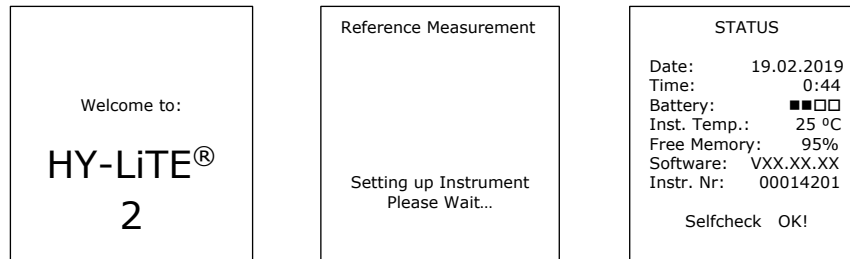
6 Switching ON/OFF

Switching ON

To switch the instrument on, press the Power button.

A self-check is performed by the instrument, and a status report is briefly displayed before the main menu appears or fast entry into one of the three operation modes.

If the reference measurement (self-check) passes, then the instrument will cycle through screens shown below and the sample well lid will open, and the instrument will be in "Test Only" mode and ready for a sample.



Automatic self-check

The HY-LiTE® 2 luminometer is equipped with the following self-check routine:

- When the instrument is switched on, a single self-check is performed with an internal reference light source. Limited deviations from the internally specified values (factory set at calibration) are automatically corrected. If a larger deviation is found no correction is made, and an error message is issued on the screen (see Chapter 14 Error Messages, Service).
- A correction of the internal, temperature-dependent background signal occurs automatically before each measurement.
These two methods of self-checking are incorporated to ensure high repeatability and reliability in daily operation.
- Dark Light is within operating limits

Automatic temperature compensation

The biochemical (enzymatic) reaction in the HY-LiTE® 2 test pen is temperature-dependent and reaches an optimum at around 22 °C. In order to obtain reliable measurement results under variable temperature conditions, the HY-LiTE® 2 luminometer is equipped with electronic temperature compensation features. This automatically compensates for temperature fluctuations and allows measurements in a working range of 5 – 35 °C for both instrument and test pens.

If the instrument or pens are at a temperature outside this working range, an error message appears on the display. The HY-LiTE® 2 system will only operate correctly when it has returned to its operating temperature range.

Automatic shut-off

If the HY-LiTE® 2 luminometer is left on but is not used, it will automatically switch itself off after approximately 15 minutes to save energy. In Test & Store and in HACCP Plan modes, measured results are secured and stored.

The measurement chamber lid will remain open to ensure that a pen is not left in the instrument.



Switching OFF

To switch the instrument off, press the Power button. The instrument will now perform a self-check to ensure that there is no test pen present in the test chamber. If the lid is open when switching the instrument off, it will prompt you to remove the pen and close the lid. If a pen is present during the self-check, the instrument lid will open, and the screen will prompt you to remove the pen. (This function will not work if the pen is not emitting light.)



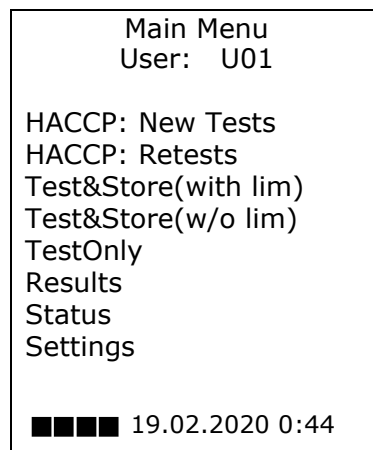
7 Main Menu

When the instrument is turned on, press the ESC button and the HY-LiTE® 2 luminometer will display the "Main Menu" screen. In the main menu, the highlighted option indicates the operation which will be selected if OK is pressed. To highlight an option, use the upwards or downwards arrow keys to scroll up or down the listed items.

You can return to the main menu screen at any time by pressing ESC

In most screens, the battery charge, date and time are displayed permanently in the bottom line. The status, displayed briefly when the instrument is switched on, can be displayed in the main menu by highlighting and selecting the option "status".

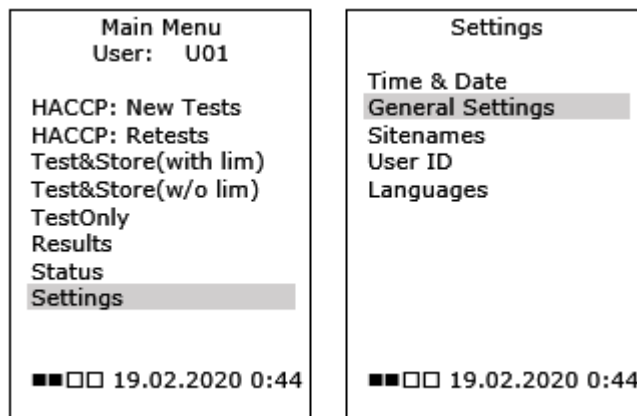
The Main Menu:



The options of the main menu are described later in this manual.



8 Settings Menu



In this menu option, the default settings of the instrument can be changed. To do this, scroll through the main menu options until Settings is highlighted, then press OK. This will call up the Settings menu. Below are listed the options contained within this menu.

Time & Date:

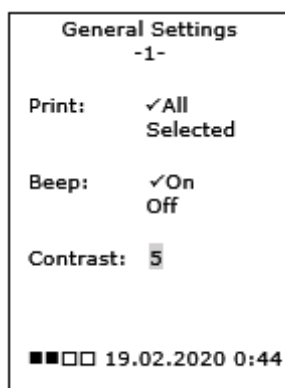
It is possible to choose between the American (MM.DD.YY), European (DD.MM.YY) or Japanese (YY.MM.DD) date formats, and the date and time can be adjusted or corrected.

To set or correct the date and time, first select (highlight and press OK) the desired date format. The highlight will then move to the first digit of the date. Using the up or down scroll keys (arrows), select the appropriate digit. Then press OK. The highlight will now move to the next digit. Repeat until the date and time is set. After setting of the last digit the program will return to the main menu screen.

General Settings:

Move through the following options in this mode by highlighting the option that you want to be "active" and press the "OK" button. The highlighter will then move to the next available choice. After setting of the option the program will return to the main menu screen. You can cancel your selection and return to main menu at any time by pressing Esc.

Page 1



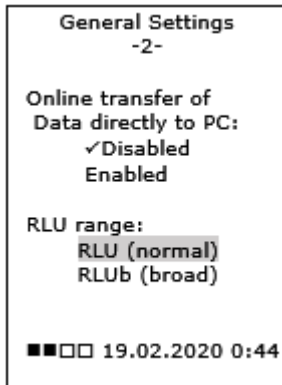
Print: if the instrument is connected to a printer, it is possible to select whether results are printed immediately or later (on request). To print immediately, select "all", to print later, select "selected".

Beep: this can be switched on to issue acoustic signals.



Contrast: the screen contrast can be adjusted here. The default setting is 5. By decreasing the number, the screen will lighten. By increasing the number, the screen will darken.

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Online transfer of data directly to PC: disable/ enable

RLU range: RLU normal/ RLU Broad

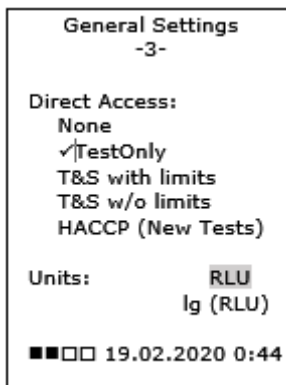
RLU range definitions are:

RLU (normal): 1 – 99,000

RLU_b (broad): 10 – 990,000 RLU

1 RLU_b = 10 RLU

Page 3



Direct Access: here, direct access to one of the measuring modes can be selected, bypassing the main menu when the instrument is switched on. This can save time in routine use. Scroll to select the desired direct access and press OK. When the instrument is switched on in Direct Access, the main menu can be called by pressing Esc.

Units: results can be displayed as linear data (RLU: Relative Light Units) or logarithmic values (log₁₀ RLU).



Sitenames:

These site names are used in the measurement mode "Test & Store" exclusively, to identify the equivalent of "Units" in a HACCP plan. Each Site will accept 50 individual measurements numbered from 1-50.

The sites carry the default names Site 1 – Site 50, but the names can be edited in the Settings menu, option Sitenames.

First select the Site to edit from the list of default sites by scrolling (up and down arrow keys). Then press OK.

You will be given the choice Edit Name and Set Limits. Select Edit Name using the up or down arrow key and pressing OK.

Edit name: by use of the up and down arrow keys, you can select characters (or certain symbols) from the list below:

Numeric values: 0 1 2 3 4 5 6 7 8 9

Capital letters: A B C ... X Y Z ...

Small letters: a b c ... x y z ...

Symbols: " ... / ! ? # \$ + ...

When the desired letter/character is reached, press OK and then set the next letter. The Site names are limited to a maximum of 16 characters, but to save the site name, you must press OK for each of the 16 spaces, even if you do not wish to enter all 16 characters. When you have completed this operation, the screen will return to the Sitenames selection screen and you can either repeat the naming of sites until finished, or you can proceed to allocate pass/fail limits to the currently selected site.

Pass and Fail limits:

Pass/Fail limits can be applied to the measurements and the classification recorded on the print-out and/or transferred with each measurement to the PC during data transfer.

The limits applied are chosen by selecting the Pass value. The Fail value is preset in the instrument to 3 times the Pass value, i.e. if Pass is set to 150 RLU, Fail will be 450 RLU. Pass values can be chosen from 20 to 500 RLU.

When limits are applied, any measurement below or equal to the Pass value will be classified "Pass". Readings at or above the Fail value will be classified "Fail", and readings between the two limits will be classified "Caution".

Set Limits:

To set the limits, first select the site you wish to set limits for and press "OK". You are giving the choice "Edit Name" and "Set Limits". Scroll to select "Set Limits" and press OK.

Using the up or down arrow keys, select the Pass value you wish to apply, and press OK. This bring up the screen "Sitenames", and you can either select another Site for editing name / setting limits or return to Main Menu by pressing "Esc".



User ID:

To be able to record the operator performing each test, you can enter up to 20 user IDs. Each user can be identified by up to 3 characters / symbols. The default user names are U01 – U20.

Note: *The user-IDs defined here are only used in the Test and Store mode (with or without limits). User IDs for HACCP plans are downloaded to the HY-LiTE® 2 instrument from the User Database in the TREND 2 Software Package.*

Select User ID:

Select "Settings, User ID" from Main Menu and press OK. This brings up the User ID's - Select screen. Scroll using up/down arrows to highlight the desired user ID and select by pressing "OK". You are then presented with the User ID's – Edit screen.

Edit User ID:

In the User ID's – Edit screen, the first character will be highlighted. Using the up and down arrows, scroll to the character required (cf. list of characters under "Edit Site Names") and select by pressing OK. Repeat until all 3 characters are selected. After selecting the 3rd character, the program will return to the Main Menu.

Language

It is possible to select from the installed languages English, German, Spanish, Polish or French.

From Main Menu select "Settings, Language". Using the up and down arrow keys, highlight the desired language and select by pressing OK. The program will return to the Main Menu, and the language will now have change to the selected language.



9 Performing a measurement with the HY-LiTE® 2 luminometer

For the measurement of HY-LiTE® pens, the measuring mode required can be selected in the main menu or - for routine use - the desired mode can be directly accessed after switching on as described in the previous chapter under "Default Settings".

The lid of the pen chamber opens automatically after the initial self-check and after each measurement. The pen is inserted in the measuring chamber with the colored cap downwards (no pressure is necessary). Closing the lid will ensure correct positioning of the pen and initiate the light measurement.

The following pages describe in detail how to perform a test in each of the five measurement modes available in the Main Menu, as well as how to display, print and delete data.

HACCP Plan

Extensive, detailed plans for hygiene or cleanliness tests in production are most easily produced with the aid of the TREND 2 software on a computer. These can then be transferred to the HY-LiTE® 2 instrument. For simplicity, plans of this kind are referred to here as "HACCP" plans.

To find out how to set up and download a HACCP plan to the HY-LiTE® 2 instrument, consult the TREND 2 software Help files and instruction tours. When a HACCP plan has been transferred from TREND 2 software to the HY-LiTE® 2 instrument, tests can be performed and stored according to the HACCP plan and the data can be printed later.

However, to get maximum benefit from the HY-LiTE® 2 system, be sure to upload all measurement results to the TREND 2 software by connecting the HY-LiTE® 2 luminometer to the PC via USB cable. This is a very simple way of ensuring reliable documentation, data management and (graphic) trend analyses of the data.

Explanation:

- Plan: This refers to the complete sequence of all test sites to be examined in a production facility in the sense of a HACCP or hygiene plan. A maximum of 64 plans can be stored in the HY-LiTE® 2 luminometer.

- Unit: This can designate subunits / parallel-running production units of a plan. Small deviations in the number and type of the test sites can be taken into account in units. A unit must consist of at least one CP or "Control Point".

- CP: This is the test site or the place where a sample is taken, which is used to verify the cleanliness with the HY-LiTE® luminometer. Up to 127 different CP's can be specified per plan.



HACCP: New Tests

This option allows you to perform a new test within a pre-loaded HACCP plan. A new test is defined as a new data record for the chosen test points.

From Main Menu, select HACCP: New Test using the up and down arrow keys, and pressing OK.

1	Main Menu
2	HACCP: New Test
3	OK
4	Select Plan from list
5	OK
6	Select Unit from list
7	OK
8	Select CP from list
9	OK
10	Select User ID from list
11	OK
12	Load pen and close lid
13	Instrument performs test
14	OK to Continue or Esc to Main Menu
15	Repeat steps 8 and 9 until finished



HACCP Plan: Retest

If the examination of a test point in a HACCP Plan has revealed that a repeat test is necessary, this can be performed later with this menu option. This retest option remains available until new tests have been performed at this point.

From Main Menu, select HACCP: Retest using the up and down arrow keys, and pressing OK.

1	Main Menu
2	HACCP: Retest
3	OK
4	Select Plan from list
5	OK
6	Select Unit from list
7	OK
8	Select CP from list
9	OK
10	Select User ID from list
11	OK
12	Load Pen & Close Lid
13	Instrument performs test
14	OK to Continue or Esc to Main Menu
15	Repeat steps 8 and 9 until finished



Test & Store (with limits)

In this mode, the measured data is displayed immediately and is stored for later printing or transfer to a computer. Individual pass / fail limits can be specified for each Site. This will classify each measurement result as "Pass", "Caution" or "Fail". For more information, please refer to section "Sitenames" and "Set Limits" above.

From Main Menu, select Test&Store (with Lim) using the up and down arrow keys, and pressing OK.

1	Main Menu
2	Test&Store (with lim)
3	OK
4	Select Site from list
5	OK
6	Select User ID from list
7	OK
8	Load Pen & Close Lid
9	Instrument performs test
10	OK to Continue or ESC to Main Menu
11	Repeat steps 4 and 5 until finished



Test & Store (without limits)

From Main Menu, select Test&Store (w/o Lim) using the up and down arrow keys, and pressing OK.

In this mode, the measured data is displayed immediately and is stored for later printing or transfer to a computer as above, but no Pass/Fail classification is applied.

1	Main Menu
2	Test&Store (w/o lim)
3	OK
4	Select Site from list
5	OK
6	Select User ID from list
7	OK
8	Load Pen & Close Lid
9	Instrument performs test
10	OK to Continue or ESC to Main Menu
11	Repeat steps 4 and 5 until finished



Test Only

From Main Menu, select Test Only using the up and down arrow keys, and pressing OK.

This is the simplest and fastest means of taking measurements with the HY-LiTE® 2 instrument. The results are displayed immediately on the screen and can be printed if connected by USB cable to an external printer.

Warning: *Test results are not stored and cannot be transferred to a PC nor printed out later. If you wish to store test results or have the ability to retrieve, print, or upload results to TREND 2 software later, configure the HY-LiTE® 2 luminometer to "Test & Store" mode.*

1	Main Menu
2	Test Only
3	OK
4	Load Pen & Close Lid
5	Instrument performs test
6	Load Pen & Close Lid to Continue ESC to Main Menu



10 Results

Previously stored results can be viewed and printed (if connected to external USB printer). And in the case of "Test & Store" mode, data can be deleted by specifying the date and measuring point here (generally or selectively). HACCP data can ONLY be deleted using the TREND 2 software package. For further information, please consult the TREND 2 Help files.

Consider deleting data from "Test & Store" on a regular basis, especially if the data has been successfully transferred to the TREND 2 software database. This ensures sufficient memory capacity for new measurements is always available in the HY-LiTE® 2 luminometer.

1	Main Menu
2	Results
3	OK
4	Select between HACCP or Test & Store
5	OK
6	Select desired HACCP plan or Site from list
7	For HACCP plans, select desired Unit from list
8	OK
9	Select desired start date from list (From:)
10	OK
11	Select desired end date from list (To:)
12	OK
13	Using arrow keys, select from options: Display, Print or Delete
14	OK
15	Data will be displayed or printed according to selected option
15 a	If Delete was selected, you will be asked to confirm the deletion. Use arrow keys to select Yes or No
16	Repeat steps 4 to 14 or 15a until finished
17	ESC to return to Main Menu



11 Status

Selecting this menu option will display date and time, the charge of the batteries (4 squares = full charge), the temperature of the instrument, % free memory, the instrument software version and the result of the last self-check.



12 Data transfer

Transferring HACCP Plans from TREND 2 to the HY-LiTE® 2

The transfer of HACCP plans from the TREND 2 software to the HY-LiTE® 2 system is fully controlled by the TREND 2 software. Connect the instrument to the PC with the USB. Please observe the procedure described in the TREND 2 “how to” files.

Transferring measurement results from the HY-LiTE® 2 to TREND 2

This operation is also controlled by the TREND 2 software. Connect the HY-LiTE® 2 instrument to available USB port on the PC. Please observe the procedure described in the TREND 2 tour.

Deleting data from HACCP Plans

The deletion of data from HACCP plans can only be performed using the TREND 2. This ensures that the HACCP data and documentation cannot be falsified. Please observe the procedure described in the TREND 2 tours.

We recommend that data is deleted from HACCP plans regularly when the data has been successfully transferred to TREND 2. This ensures that sufficient memory capacity for new measurements is always available in the HY-LiTE® 2.



13 TREND 2 Software Installation on PC

Introduction to TREND 2

TREND 2 is a powerful data analysis program for your computer. It provides the capability, to easily create "HACCP-Plans" for cleanliness control on the PC and to download them to the HY-LiTE® 2 system. A plan can consist of a number of units each containing a list of test points with specified pass/fail limits. A template function allows convenient use of existing plans as a basis for new ones. For data analysis purposes, you can also merge different plans, enabling you to compare performance between different production areas or even factories.

Measurement results, which are collected and stored within the HY-LiTE® 2 system, can at a later stage easily be uploaded to the PC for data analysis. Very convenient handling steps allow exciting graphical analysis and presentations of the collected data. The pre-defined graph formats can be adjusted and stored to suit your personal preferences for data presentation.

The TREND 2 software provides extremely high security through 3 different password-protected access levels and auditable documentation of all plan and data records. An effective working environment under the different Windows formats allows comfortable handling as well as export of data in spreadsheet format for import into other programs.

Compared to the former Trend software the on-line help functions are very much extended, eliminating the need for a printed software manual.

The USB stick also contains a series of instructional "how to" files which will take you through most functions of the software, including a guide on how to use TREND 2 for setting statistically derived Pass/Fail limits based on your own data.

TREND 2 is part of the complete HY-LiTE® 2 Compact Kit. It is provided as USB stick, including all available language versions and the already mentioned "How to".

Installation Guide

This version of TREND 2 software is compatible with Windows 10.



ID and Password: Initiating TREND 2

Before you can begin using TREND 2, it must be initiated by defining at least one "Full Access" user.

To open the program for the first time, use the following user ID and Password:

User ID: **hlt**
Password: **cardiff**

After entering, you **MUST** go to the menu "Options" and select "User Database" to create at least one new user with "Full Access".

In the User Details dialog box, click "New" and enter the new user ID and password in the appropriate fields.

Before you define your personal password, click "Full Access" so assign yourself the highest access level.

Now click "Password" to open the "Change Password" dialog box.

Under "Your password" enter "cardiff".

Under "New password for" enter your new password. Repeat the new password under "Verify the new password for" and then click OK to close the box. Continue clicking OK until all boxes are closed.

Next click menu "File" and select "Exit" to close TREND 2.

Next time you open the program, use your personal User ID and password. TREND 2 is now fully functional.

The user ID "hlt" and the password "cardiff" are now disabled.

TREND 2 training "How to"

In addition to TREND 2, the USB contains a series of training "How to", which will guide you through the program in a self-explanatory manner. These are located in the directory "How to".



14 Error Messages, Service

Quality guarantee

The HY-LiTE® 2 luminometer is a rugged, light and portable instrument which can be used either at the site of the hygiene test or in a laboratory.

The most modern production methods and constant in-process examinations guarantee the high-quality workmanship and long service life of the HY-LiTE® 2 luminometer. Each instrument is calibrated against reference sources and is subject to extensive quality tests.

Merck KGaA, Darmstadt, Germany affords a guarantee of 12 months from the date of delivery for correct usage.

Error messages

Several internal or external factors can lead to errors during measurements or in the handling of the HY-LiTE® 2 instrument. The HY-LiTE® 2 instrument is equipped with a modern self-diagnostic system to detect such errors and causes of faults and is capable of indicating the causes to the user by corresponding error messages on the display.

This allows rapid fault-finding and the determination of suitable countermeasures to correct faults.

In many cases, repeating procedures correctly is sufficient to proceed with work without errors. If an insufficient battery charge is indicated, a new set of batteries must be inserted, or work must proceed with the power supply unit.

You may occasionally see the following messages, which are not errors, but only information / warnings:

" - - - - "

Light overload. The light signal is equivalent to >99000 RLU

"No HACCP plan in memory"

Press <ESC> to return to Main Menu. (You have accidentally requested to perform a measurement in HACCP mode without having loaded a sampling plan).

If any other error message is displayed by the HY-LiTE® 2 instrument, please contact your local technical service.

Service, repairs

If a fault cannot be alleviated by switching the instrument off and back on and repeating procedures, servicing or replacement by the manufacturer may be necessary.

For this, please consult your local supplier, naming the cause of the fault and the serial number of the instrument to allow a correct and rapid servicing. Never attempt to repair or open the instrument yourself.



Cleaning

The instrument housing should be cleaned only with a damp cloth and then wiped dry.

If liquids enter the measuring chamber during use of the HY-LiTE[®] 2 instrument or if the background signal is unusually high (i.e. values greater than 5 RLU in measurements without a pen), the measuring chamber should be cleaned as follows:

The cuvette holder can only be removed or replaced while the instrument is switched ON.

Remove the cuvette holder and clean it carefully to avoid scratching the plastic. If the cuvette holder is scratched or can no longer be used (indicated by failure of the self-check routines), a new cuvette holder is available as a separate spare part.

Caution: do not damage components inside the instrument when the cuvette holder is removed.

Replace the cuvette holder carefully in the correct position without damaging the unprotected sensors in the measuring chamber. Then switch off the instrument and initiate an automatic self-check of the instrument by switching it back on.

For cleaning, always try in the following order:

- Water
- Water + mild soap / detergent
- 70% Ethanol or Isopropanol

Warning: *Never use solvents, acids or alkaline solutions.*

Storage, transport

The HY-LiTE[®] 2 instrument should never be exposed to temperatures below -5 °C or above 55 °C , as this can damage the electronics. The instrument should be protected against extreme cold under all circumstances.

If the instrument has been exposed to low temperatures, it will only operate correctly after it has returned to within the operating temperature range ($5 - 35\text{ °C}$). Warming up will take approximately one hour.

If the instrument is moved from a cold to a warm and moist environment, the development of condensation will occur. To avoid excessive condensation forming inside the instrument, please retain the instrument in its transport bag or case until the temperature has adjusted completely.



15 Abbreviations

ATP	Adenosine triphosphate is the substance measured with the HY-LiTE® 2 system.
C, Caution	Caution: the results of cleaning could be better. Look for causes when repeating.
CIP	Cleaning in place. The cleaning must also be examined in enclosed machinery.
CP	Control Point. This specifies the test site/place.
Display	Screen display of the HY-LiTE® 2 instrument.
ESC	Escape: Pressing this button returns to the main menu.
F, Fail	The results of cleaning do not meet the requirements; recleaning is necessary.
HACCP	Hazard analysis of critical control points. Concept for risk analysis. A necessary basis for this is the examination of cleaning results.
Limit	Limits (pass, fail) specified by the user for classification of the measurement results.
log, log10	Indicates results printed in log 10 RLU.
Menu	Selection of options offered on the HY-LiTE® 2 display.
N	New Test. (Indicated on printout of HACCP-Plan result).
O	Overload/Extreme ATP content: The measured value exceeds the measuring range.
OK	An entry or consent to an offered choice is confirmed by pressing this button.
P, Pass	The results of cleaning meet the requirements.
PWR	Message on screen display, indicating, that HY-LiTE® 2 instrument is connected to A/C power supply unit.
Plan	Refers to a HACCP plan loaded from the TREND 2 software package.
R	Retest of a previously performed measurement, which is to be re-examined.
RLU	Relative light units as the measured unit are proportional to the degree of contamination.
RLUb	RLU broad, refers to the extended RLU range (10X RLU normal)
Scrolling	Navigation in the display is possible with the arrow buttons.
Unit	Subunit or variation of an entered (HACCP) plan.



16 Technical Data

	HY-LiTE® 2 System
Dimensions	11 x 13 x 28 cm (W x H x D)
Weight	1.3 kg
Application	Primarily for examination of cleaning in food production environments. The HY-LiTE® 2 system may only be used with HY-LiTE® 2 pens.
Display of results	Display of the light intensity (from bioluminescence) in relative light units.
Working range, normal	Linear: 0 – 99.000 RLU Logarithmic: 0 – 5.00 log ₁₀ RLU
Working range, broad (10 x normal)	Linear: 0 – 99.000 RLUb Logarithmic: 0 – 5.00 log ₁₀ RLUb
Self-checks	<ul style="list-style-type: none"> • An automatic self-check against a built-in standard reference light source is performed when the instrument is switched on • An automatic correction of the background signal is performed before each measurement • An automatic temperature compensation during each measurement
Data handling	Optimum usage of the memory capacity by intelligent data handling: Over 2000 measurement results can therefore be stored together with the complete data records (measurement result/date/time/test site/user/pass-fail interpretation). Display information of the free memory capacity.
Test modes	HACCP Plan, Test & Store, Test Only.
Display	Graphic LCD display with 14 lines and adjustable contrast.
Control buttons	Power button and 4 function buttons.
Ambient conditions	Measurements at 5 – 35 °C, 5 – 90% air humidity, altitude <2000 m <ul style="list-style-type: none"> • When moved from a cold to a moist, warm environment, the development of condensation must be prevented • Measurements should be performed with the system in a horizontal position: the height of the front and rear edges should not differ by more than 5 cm
Connections	USB port
Mains operation	The HY-LiTE® 2 luminometer can be connected to A/C power in nearly any country in the world with the HY-LiTE® 2 power supply and 4 A/C adapters delivered as standard accessories.
Luminometer power	12V DC ; 0.8 A
Power supply	Input: 100 – 240V AC; 50 – 60 Hz; 200 – 400 mA Output: 12V DC; 1500 mA
Portable operation	Recommended batteries: 4 normal, sealed 1.5 V alkaline batteries, size Mignon LR6 AA.
Technical revisions	Changes to the HY-LiTE® 2 system in compliance with technical progress reserved.



17 Revisions

Date	Rev	Nature of change
05/2020	A	Initial Release



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