hönle group

hönle uv technology

Operating Manual

UV Meter BASIC
UV Meter HighEnd

16520h

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Layout: Dr. Hönle AG

Table of contents

1. Introduction

This user's manual introduces you to the UV Meter, explains how to operate it and the range of possible applications.
It contains safety information and information on danger points to ensure safe and correct operation of the UV Meter.

The following pictograms are used in the manual:

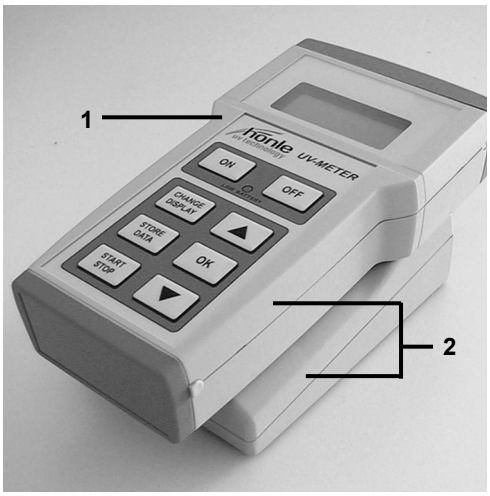
ATTENTION
This symbol indicates a potentially dangerous situation, possible damage to the equipment or a potential health hazard.

NOTE
This symbol indicates notes, tips for application and other useful information.

2. Description

The Hönle UV Meter is a mobile, hand-held device for measuring UV radiation and the appropriate dosage. It is available in two versions.
The UV Meter BASIC is used for individual measurement with a sensor.

With the UV Meter HighEnd, it is possible to take parallel measurements from two different sensors. In addition, it has a Datalogger function with a PC interface for easy evaluation and archiving of the measurement data.



(1) UV Meter BASIC
without docking station

(2) UV Meter HighEnd
Unit with docking station

Areas of application

Areas of application

The UV Meter can be used both in the laboratory and in production plants. It provides the measurements for quantitative monitoring and adjustment of the production parameters, for documentation purposes, for ensuring the maintenance of quality standards and quality control. The equipment can be used both in open working areas and in closed plants.

ATTENTION
The UV Meter must not be used for applications in the field of medical technology, for monitoring medical and therapeutic radiation devices or for measuring radiation levels in places of work in accordance with the guidelines of professional associations for the prevention of health risks caused by UV radiation.
The Hönle AG cannot be held liable for any damage resulting from the use of the Hönle UV Meter.

Features

Features

- Measurement of UV radiation intensity and the radiation dosage
- Automatic reading of up to eight different sensors such as surface sensors, light guide sensors or quartz rod sensors
- Mobile operation with 6 standard Mignon batteries or NiMH rechargeable batteries
- Operating time: approx. 25 hours
- Simple and straightforward operation using only 8 operating keys
- Text-based and variable-language operator prompting
- Text display with 4x16 characters and press-switch background illumination
- Choice of unit for measurement data
- Measurement display: 5-digit with floating point
- Measurement with AutoStart with definition of limit value
- Choice of time display:
  real time and day or relative radiation exposure time during measurement
- Energy-saving through AutoPowerOff and AutoLightingOff functions

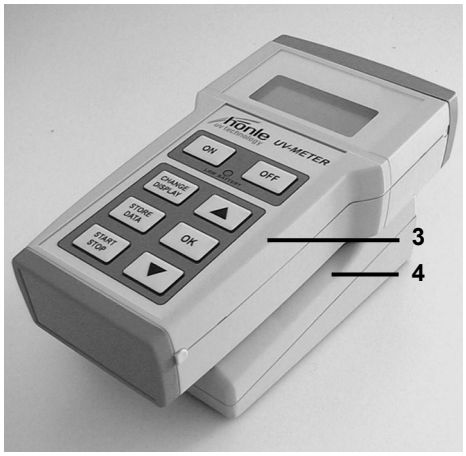
Additional features of the HighEnd version

Additional features of the HighEnd version

- Parallel measurement of two sensors applied simultaneously via an additional second input channel
- Storage of readings
- Measurement storage facility with a capacity of 1000 data records
- RS232 interface for the transmission to and evaluation of the readings by PC
- Online operation: Reading of current measured values via the RS232 for evaluation in a PLC
- Rapid battery charging mode using NiMh rechargeable batteries with a charging time of approx. 3 hours.
- Power supply module for continuous operation
- Docking station can be used as table-top casing or a wall holder

Description of individual parts and operating elements

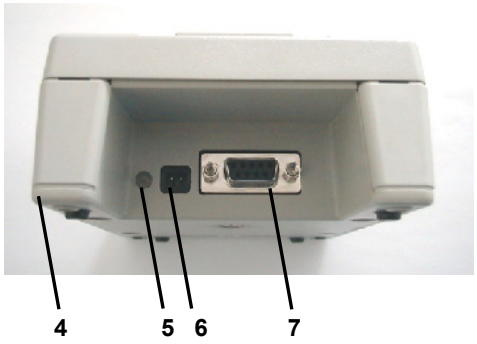
Description of individual parts, operating elements and additional equipment



(3) UV Meter

(4) Docking station
Only HighEnd version

operating elements

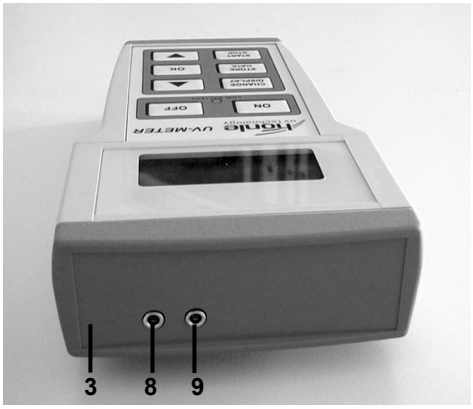


(4) Docking station
Only HighEnd version

(5) Status LED
green: Power ON
yellow: Charge batteries

(6) Power pack connection point
For connection to external power supply module

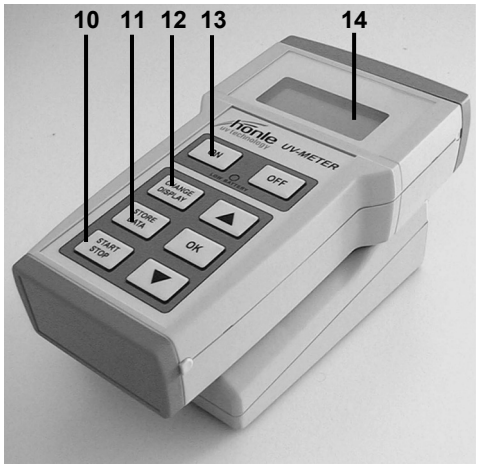
(7) Connector for RS232 interface
For data transmission to PC



(3) UV Meter

(8) Measuring head input for channel A

(9) Measuring head input for channel B
This function only assigned for the HighEnd version.



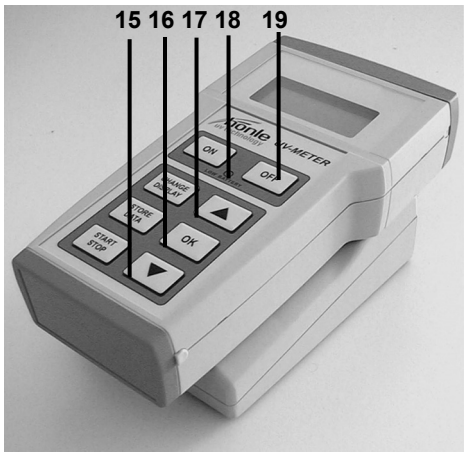
(10) "START/STOP" key
Manual start/stop of measuring interval

(11) "STORE DATA" key
This function only assigned for the HighEnd version.
Storage of data records
Freezing the current measured value on the display.

(12) "CHANGE DISPLAY" key
Selection of main menu

(13) ON key
Switches on the equipment

(14) Display
Displays menu text



(15) "DOWN" arrow
For entering figures and selection of submenu

(16) "OK" key
Selection of menu lines and confirmation of input

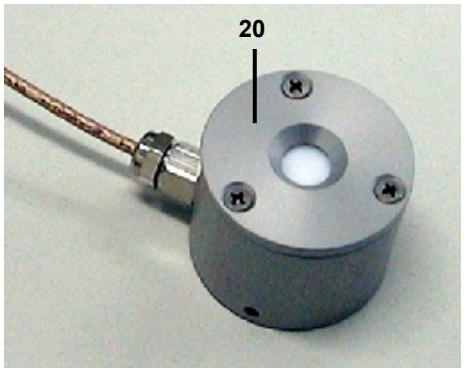
(17) "UP" arrow
For entering figures and selection of submenu

(18) Low Battery display
Displays when batteries/rechargeable batteries are almost completely flat

(19) OFF key
Switches off equipment

Surface sensors

Surface sensors



(20) Surface sensor
Three different spectrum ranges

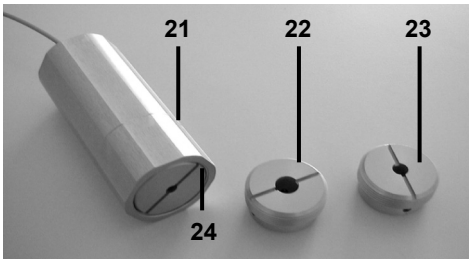
Dimensions: Ø = 35 mm
h = 27 mm

Sensor designation	Spectrum sensitivity	Max. sensitivity	Intensity range	Article / Order number
FS UV-C D1	230 - 285 nm	270 nm	100 - 2000 mW/cm²	16403
FS UV-C D0	230 - 285 nm	270 nm	1 - 200 mW/cm²	16420
FS UV-B D1	290 - 330 nm	310 nm	100 - 2000 mW/cm²	16402
FS UV-B D0	290 - 330 nm	310 nm	1 - 200 mW/cm²	16419
FS UV-A D1	330 - 400 nm	360 nm	100 - 5000 mW/cm²	16401
FS UV-A D0	330 - 400 nm	360 nm	1 - 200 mW/cm²	16418
FS VIS D1	380 - 550 nm	470 nm	100 - 2000 mW/cm²	16404
FS LED D1	265 - 485 nm	365 - 410 nm	100 – 20 000 mW/cm^2	38677

ATTENTION
The sensors are only suitable for short-term measurement (max. 10 sec.) in a splash-proof environment, as otherwise premature ageing and thermal destruction of the sensor will occur.
The housing temperature must never exceed 80 °C!

Light guide sensors

Light guide sensors



(21) Light guide sensor
The light guide sensor serves as an adapter for light guides.
On each adapter, an insert can be fitted to suit the light guide diameters of 3 mm, 5 mm and 8 mm

(22) Insert for light guide diameter 8 mm

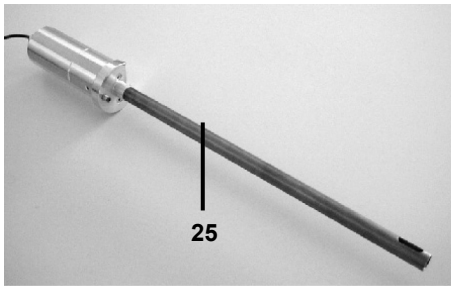
(23) Insert for light guide diameter 5 mm

(24) Insert for light guide diameter 3 mm

Sensor designation	Spectrum sensitivity	Max. sensitivity	Max. radiation intensity	Article / Order number
LLS UV-C D1	230-285 nm	270 nm	20 W/cm^2	16407
LLS UV-A D1	330-400 nm	310 nm	20 W/cm^2	16406
LLS LED D1	265 – 485 nm	364- 410 nm	100 – 20 000 mW/cm^2	45619

ATTENTION
The sensors are only suitable for short-term measurement (max. 10 sec.) in a splash-proof environment, as otherwise premature ageing and thermal destruction of the sensor will occur.
The housing temperature must never exceed 80 °C!

Quartz rod sensors



(25) Quartz rod sensor
The quartz rod sensor can be inserted into print devices through a special aperture, thus measuring the radiation intensity.
It is available in two versions and in three different lengths.

Sensor designation	Spectrum sensitivity	Max. sensitivity	Max. radiation intensity	Length	Article / Order number
QSS UV-C D0	230 - 285 nm	270 nm	20 W/cm²	**80 mm**	16411
				146mm	19906
				260 mm	16409
QSS UV-A D0	330 - 400 nm	360 nm	20 W/cm²	**80 mm**	16410
				146 mm	16417
				260 mm	16408

ATTENTION
The sensors are only suitable for short-term measurement (max. 10 sec.) in a splash-proof environment, as otherwise premature ageing and thermal destruction of the sensor will occur.
The housing temperature must never exceed 80 °C!

3. Safety instructions

General information

General information

A sound knowledge of the general safety regulations is essential for safe and fault-free operation of the UV Meter.
This user's manual contains all important safety regulations to ensure safe operation of the equipment.
This user's manual, and in particular the safety instructions, must be observed by all persons working with the equipment.

In addition, all relevant rules and accident prevention regulations relating to the operation site must be observed.
At regular intervals, the operator will check that all personnel are observing the safety regulations.

Under the **Health and Safety Management at Work Regulations 1999**, users are required to carry out a suitable and sufficient assessment of the risks created by the use of the UV Meter. They must ensure adequate control measures are in place to minimise or eliminate any of the risks created. The information contained within this manual will assist in creating your own risk assessment.

Staff obligation

Staff obligation

Before commencing work, all persons working with the UV Meter undertake the following:

- to observe the safety at work and accident prevention regulations.
- to read the chapter on safety and the warnings printed in this manual and to observe them at all times while using the equipment

Danger when using the equipment

Danger when using the equipment

The UV Meter has been manufactured in accordance with the very latest state-of-the-art technology and the recognized rules of safety technology.

The equipment is to be operated only under the following conditions:

- Personal Protective Equipment (PPE) is worn to protect eyes and skin.
- for the purpose for which it was constructed
- in a condition in which it complies with all the requirements of safety technology

ATTENTION
Improper use endangers the health of the user or third parties!
It may also result in damage to the equipment or other material damage.

NOTE
Any faults impairing the safe operation of the equipment must be remedied immediately.

Appropriate use

Appropriate use

The UV Meter is a measuring device for measuring the intensity of UV radiation in industrial applications.
Any other use or use above and beyond these terms is defined as inappropriate and thus dangerous.
The operator must observe all instructions in this manual when operating the equipment.
The operator is under obligation to ensure that the prescribed servicing, maintenance and cleaning work is carried out and that worn parts are replaced in the course of such work.

The following are also defined as preconditions for appropriate use of the equipment:

- observance of all instructions in this manual
- the execution of all servicing, maintenance and cleaning work
- compliance with the general and specific safety instructions in this manual
- compliance with the relevant accident prevention regulations

NOTE
The Dr. Hönle AG is not liable for damage resulting from inappropriate use of the equipment.

Warranty and liability

Warranty and liability

The "General sales and delivery conditions" of the Dr. Hönle AG apply. The operator will have received these terms, at the latest upon the closing of the contract. The Dr. Hönle AG is not liable for any damage to persons or property arising from any one or more of the following:

- inappropriate use of the UV Meters
- incorrect assembly, commissioning, operation and servicing of the equipment.
- operation of the UV Meters with faulty and/or non-functioning safety devices or protective devices
- non-observance of the instructions given in the user's manual with reference to the safety, transport, storage, assembly, commissioning, operation, servicing and maintenance of the device
- unauthorized alterations to the construction of the UV Meter
- negligent monitoring of equipment parts subject to wear
- repairs which are carried out incorrectly
- catastrophes, the action of foreign bodies or acts of God

4. Safety instructions

Organizational measures

Organizational measures

All safety devices on the equipment must be tested for correct functioning each time prior to carrying out any work. Look for external signs of damage.

Informal safety measures

Informal safety measures

In addition to this user's manual, the generally and locally applicable accident prevention and environmental protection regulations must be made available and observed.

Thermal hazards and danger caused by radiation and gases

Thermal hazards and danger caused by radiation and gases

All safety regulations relevant to the equipment used for measurement and the radiation sources must be observed to the letter.

ATTENTION
Improper handling of equipment employing or emitting UV radiation can result in serious physical injury!

Danger caused by electricity

Danger caused by electricity

The electrical equipment of the UV Meter must be inspected regularly.

The following must be inspected before commencing work:

- check all equipment components for external signs of damage
- check that all electrical cables are in perfect working order
- Loose connections must be remedied and damaged cables replaced immediately

ATTENTION
There is danger caused by direct or indirect contact with electricity!

NOTE
Protective articles are listed in the chapter "Order data for equipment, spare parts and accessories".

Servicing and maintenance, remedying faults

All necessary maintenance work is described in the chapter "Servicing, maintenance and cleaning; Maintenance". These tasks are necessary to ensure fault-free operation.
In the event of a fault in the operation of the UV Meter, the chapter "Faults" offers information on the causes of faults and advice on how to remedy them.
In the unlikely event of a fault occurring which cannot be remedied with the help of the fault list, contact the customer service department of the Dr. Hönle AG.
Any components which are not in perfect condition must be replaced immediately.
Only use original spare and wear parts.
Other parts may not be adequate for the application or constructed to the same high safety standards.

No changes may be made to the UV Meter, no fittings may be added or conversions carried out without obtaining the prior permission of the Dr. Hönle AG.
Contact address for claims under warranty, repair and spare parts service:

Dr. Hönle AG
UV-Technologie
Lochhamer Schlag 1
D-82166 Gräfelfing / München

Tel.: +49 (0)89 / 856 08-0
Fax: +49 (0)89 / 856 08-148
E-mail: uv@hoenle.com
WebSite: www.hoenle.de

ATTENTION
No repairs or changes may be made to the equipment other than those listed in this user's manual

5. Transport, storage, delivery

Delivery

Delivery

The UV Meter BASIC consists of four, the UV Meter HighEnd of eight individual parts delivered in a plastic case.

UV Meter BASIC

- User's manual
- UV Meter BASIC (1)
- 6 Mignon AA batteries (27)
- Case for UV Meter BASIC (26) with compartments for:
  - light guide sensor (28) including adapter
  - three surface sensors (29)

UV Meter HighEnd

- User's manual
- UV Meter HighEnd (3) including six NiMH rechargeable batteries
- Docking station (4)
- SUB-D lead (33), 9-pole plug socket for RS232 interface
- power supply module (35)
- mains lead with European plug (36)
- case for UV Meter HighEnd (30) with compartments for:
  - light guide sensor (32) including adapter,
  - three surface sensors (31) and
  - quartz rod sensor (34)

Check that all parts have been delivered in sound, undamaged condition.
Document any damage and report it immediately to your specialist dealer or contact the Dr. Hönle AG directly.

Contact address:

Dr. Hönle AG
UV-Technologie
Lochhamer Schlag 1
D-82166 Gräfelfing / München

Tel.: +49 (0)89 / 856 08-0
Fax: +49 (0)89 / 856 08-148

NOTE
Dispose of any packaging material in an environment-friendly manner or re-use it! We would particularly recommend you to keep the packing material if you intend to mail the device or otherwise transport it.

Storage and Transport

Storage and Transport

The measuring equipment and the additional equipment should always be stored and transported in its case.

6. Setting up, commissioning and operation

General information

General information

- The UV Meter and the docking station are only to be used in dry rooms.
- The equipment, the sensors and the station must be protected from splashing with water and rain.
- The equipment and the station must be protected against chemical vapours.
- The equipment should not be jolted.

Setting up the docking station of the UV Meter HighEnd

Setting up the docking station of the UV Meter HighEnd

Engaging clip

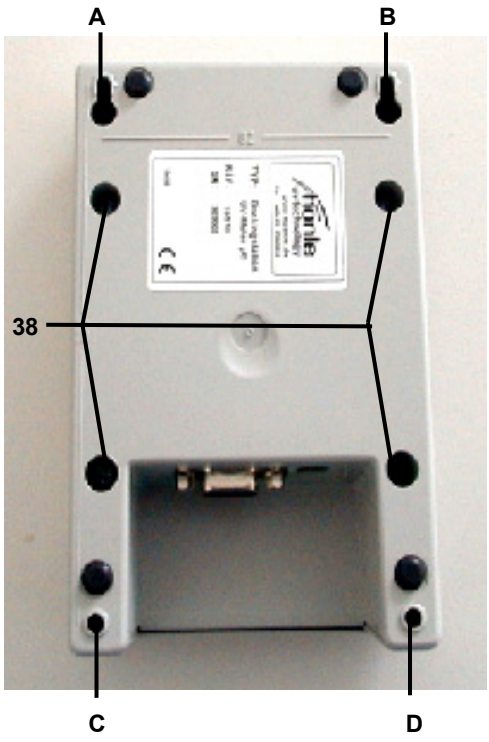
Engaging clip

UV Meter HighEnd

The sliding clip (37) is used to adjust how tightly the docking station and the UV Meter engage, depending on the individual circumstances of the application.

Wall mount of the UV Meter

At manufacture, the docking station is assembled for table-top use.
However, if required, the docking station can also be wall-mounted.



UV Meter HighEnd

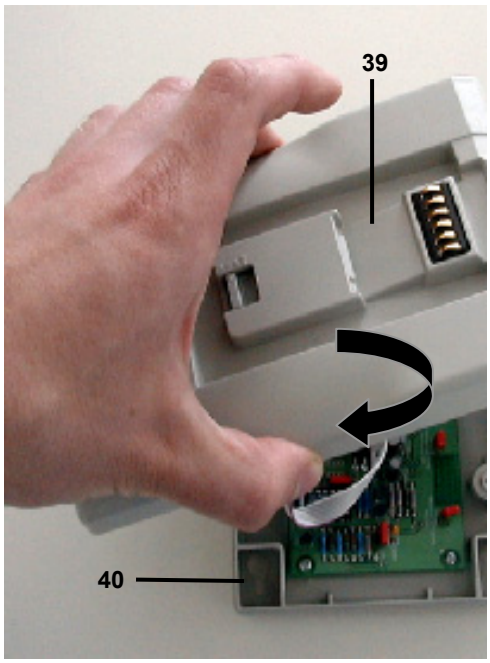
Four holes are required in the base of the docking station to enable it to be wall-mounted.

Spacing of holes: from A to B = 82 cm
from C to D = 82 cm
from A to C = 138 cm
from B to D = 138 cm

If the docking station is operated mounted on a wall, the cover must be turned 180°.

To do this:

- Unscrew the four screws (38) on the base.



- Lift off the cover (39).
- Turn cover (39) 180°.
- Replace cover (39).
- Screw together cover (39) and base (40) again, using the four screws.
- Place the docking station in the wall mount.

Commissioning

Commissioning

Power supply for the UV Meter BASIC

Power supply for the UV Meter BASIC

For operation of the Hönle UV Meter as a portable device, there is a separate battery compartment in the lower section. The equipment can be operated using Mignon AA batteries or NiMH rechargeable batteries.

The BASIC version is delivered complete with a set of 6 Mignon AA batteries. These have to be inserted in the equipment before it can be operated. See: "Servicing, maintenance, cleaning; Replacing batteries"

ATTENTION
Non-rechargeable batteries must be removed from the measuring equipment once they are flat.

NOTE
Spent batteries should never be placed in the usual rubbish, but must be disposed of in an environment-friendly manner at local waste collection centres.

NOTE
The UV Meter BASIC can also be run on rechargeable batteries, see: "Servicing, maintenance, cleaning; Replacing batteries". In this case, the rechargeable batteries must be removed from the equipment when flat and recharged in an external battery charger.

Power supply for the UV Meter HighEnd

Power supply for the HighEnd UV-Meter

The HighEnd version is delivered complete with a set of 6 NiMH rechargeable batteries in the battery compartment. These batteries can be charged via the docking station without removing them from the battery compartment. See: "Menus and RS232 terminal commands; Docking station; Settings; Charging batteries".

NOTE
When the measuring equipment is inserted in the docking station, power is supplied via the station’s external power supply module. This allows continuous measurement over a longer period of time without power failure.

Power supply for the docking station

Power supply for the docking station

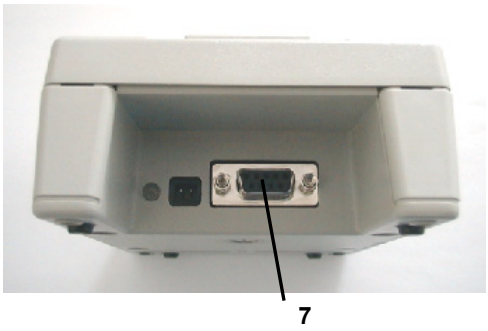
The equipment is delivered with an external power supply module with a mains lead.

- Connect power supply module at connector (6).
- Connect up mains lead with European plug.

Input voltage range: 100.....240 V
50.....60 Hz

Connecting the HighEnd to a PC

Connecting the UV Meter HighEnd to a PC



Data transmission to a PC is carried out via the RS232 interface using the Sub-D lead included in the delivery.

ATTENTION
To prevent damage to the PC interface, it should only be connected or disconnected when the PC and the power supply module of the docking station are switched off.

Connecting up the sensors

Connecting up the sensors

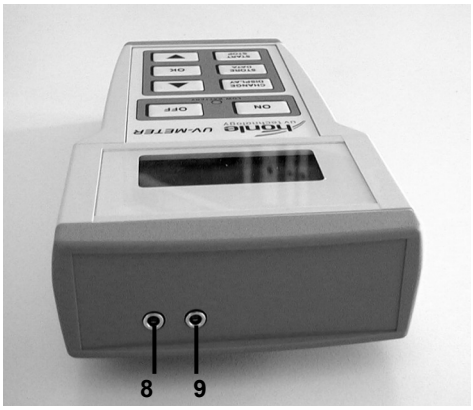
Each measuring device can recognize and handle data from 8 different sensors. Before the equipment is delivered, the Hönle AG specialists register and calibrate the sensors in the equipment's data memory.
When a sensor is connected up, it is automatically recognized and the calibration data is downloaded from the data memory.
All measuring heads and the measuring equipment itself are assigned the same serial number. This ensures easy identification of the sensors and the measuring device.

ATTENTION
Before connecting up or replacing a sensor, the UV Meter must be switched off by means of the OFF key or by removing it from the docking station.

NOTE
If the sensors are connected up to another Hönle UV Meter, this meter will display incorrect values or generate a fault message.

NOTE
After connecting up or replacing a sensor, it is essential to adjust the offset in order to rule out the possibility of receiving very distorted readings. See: "Menus; Menu window: Display, function and operation; 3. Measuring menu "Adjust offset"".

UV Meter BASIC



UV Meter BASIC

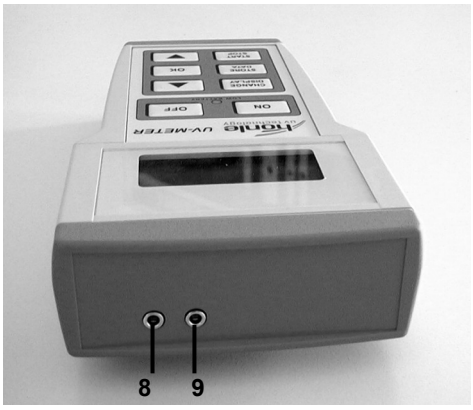
All UV Meters have two sockets (8,9) for connecting up the measuring sensors.

Input (8) is assigned channel A, input (9) is assigned channel B.

In the BASIC model, input (9) for channel B has no function.

Connection of sensor
- Insert the plug of the desired sensor into the socket (8).

UV Meter HighEnd



UV Meter HighEnd

All UV Meters have two sockets (8, 9) for connecting up the measuring sensors.

Input (8) is assigned channel A, input (9) is assigned channel B.

Both inputs can be used at the same time for parallel measurement.

Connection of sensor
- Insert the plug of the desired sensor into socket (8) and/or socket (9).

Operation

Operation

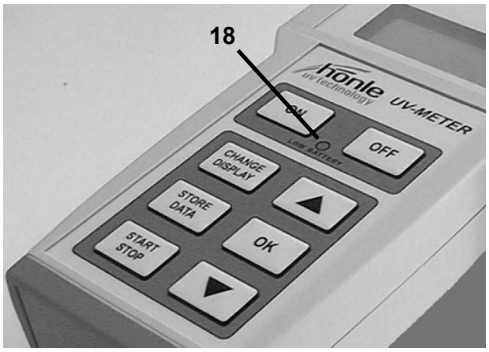
Readiness for operation UV Meter BASIC

Readiness for operation UV Meter

The UV Meter BASIC is ready for operation when it is fitted with charged batteries or rechargeable batteries and at least one sensor corresponding to the measuring device is connected up.

NOTE
The sensors are always clearly assigned to their respective measuring device. Connecting up a sensor to another Hönle UV Meter will result in distorted readings or a fault message.

LowBattery display



UV Meter HighEnd

As soon as the battery charge approaches its lowest point, the LowBattery display on the UV Meter lights up (18). Once this display lights up, the readings taken are no longer reliable and the batteries must be replaced or recharged.
See: "Servicing, maintenance, cleaning; Replacing the batteries".

ATTENTION
Never insert the device into the docking station and start the charging process if there are normal, non-rechargeable batteries in the battery compartment. Doing so could result in the destruction of the measuring device or even cause the batteries to explode!

Readiness for operation Docking station

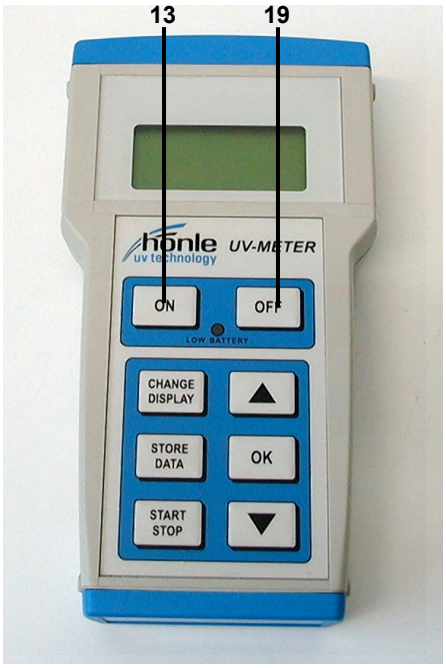
Readiness for operation Docking station

The docking station is ready for operation when it is connected up to the power supply by means of the external power supply module and the mains lead.

Switching on and off

Switching on and off

UV Meter



UV Meter

- Check that the equipment is ready for operation.
- Press ON key (13).
  The equipment is switched on.

Shortly after switching on, the serial number and the software version are displayed for approximately 5 seconds.

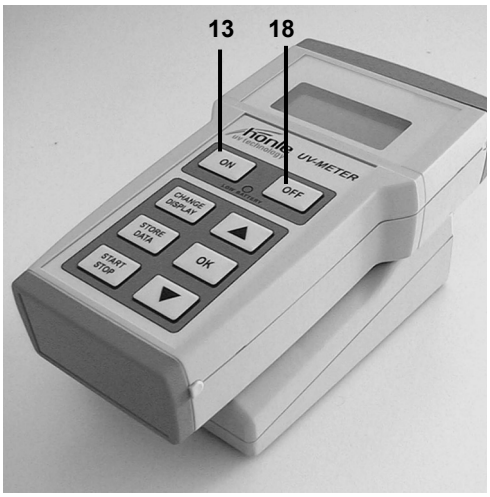
Then the selection menu "Input A" appears.

If a longer period of time elapes without any key being pressed, the equipment switches off automatically.

- Press OFF key (19).
  The equipment is switched off.

NOTE
The automatic switch-off time can be altered in the settings menu, see: "Menus and RS232 terminal commands, Menu windows: Display, function and operation; Settings; Auto-off".

UV Meter HighEnd in docking station



UV Meter HighEnd in docking station

- Check that the equipment is ready for operation
- Place the measuring device in the docking station.
  The device switches on automatically.

Shortly after switching on, the serial number and the software version are displayed for approximately 5 seconds.

Then the selection menu "Docking station" appears.

If a longer period of time elapses without any key being pressed, the equipment switches off automatically.

The OFF key (19) has no function.

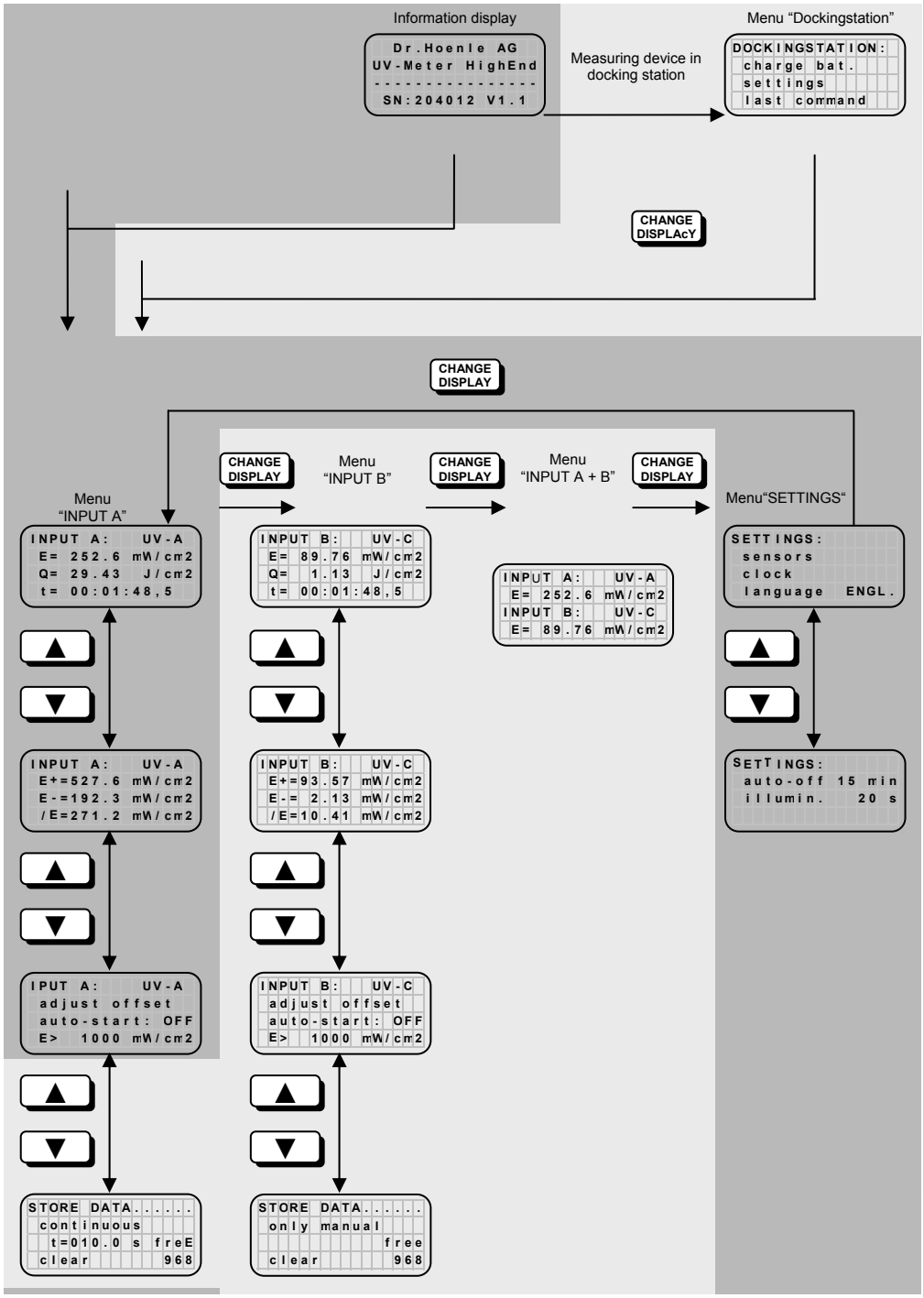
Fault message

Fault message

In the event of a fault, a fault message appears on the display screen of the UV Meter, see: "Faults".

7. Menus and RS232 terminal commands

Overview of menus



Joint menu displays:
BASIC and UV Meter HighEnds

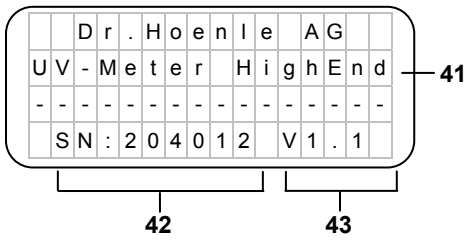
Additional menu displays:
UV Meter HighEnd

Menu windows: Display, function and operation

Menu windows: Display, function and operation

Information display

Information display



After switching on the equipment, the "Information display" appears for 5 seconds.

(41) Equipment version
Display: UV Meter BASIC or
Display: UV Meter HighEnd

(42) Serial number

(43) Software version

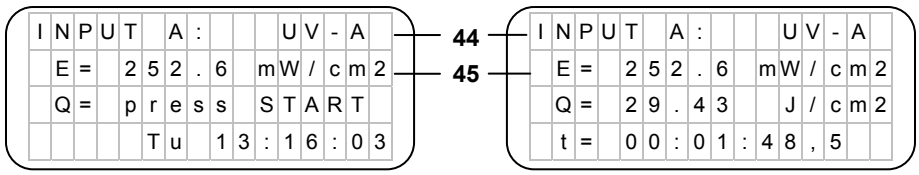
Measuring menus

Measuring menus

1st measuring menu

1st measuring menu

Five seconds after switching on, the display changes to show "INPUT A", the first measuring menu.



Display between readings

Display during measurement

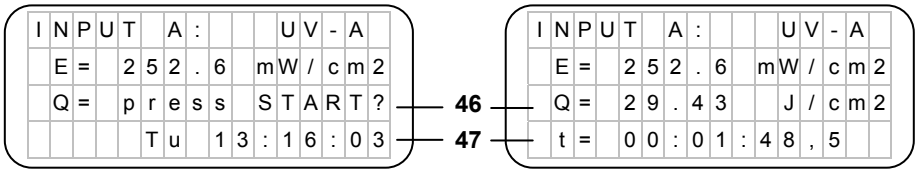
(44) Info line

The first line of the measuring menu shows the current input channel (INPUT A or INPUT B) and the designation of the sensor which is currently connected up.

(45) Displaying the radiation intensity E

The current radiation intensity is displayed and the display constantly refreshed.
On fabrication, the units mW/cm2, W/cm2 and W/M2 are available.

To change the unit on the display:
- Select line "E = ..." using the arrow keys ▲▼.
- Confirm your selection with the OK key.



Display between readings

Display during measurement

(46) Displaying the radiation dosage Q

Here, the radiation dosage (integration of the radiation intensity over time) is calculated during the measurement process. On fabrication, the units mJ/cm2, J/cm2, kJ/cm2 are available.

To change the unit displayed:
- Select line "Q = ..." using the arrow keys ▲▼.
- Confirm your selection with the OK key.

To start the integration process:
- Start the measuring process using the START/STOP key

or
- Start via the Autostart function (see "Autostart function").

(47) Displaying the time or exposure time t

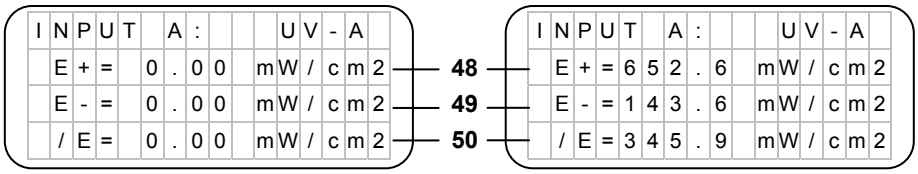
This line shows either the current time (t absolute) or, during measurement, the exposure time which has already elapsed (t relative).

Switching from current time to exposure time t:
- Select line using the arrow keys ▲▼ .
- Confirm your selection with the OK key.

2nd measuring menu

2nd measuring menu

Changing from 1st to 2nd measuring menu:
- Press arrow key ▼ until the next menu appears.



Display between readings

Display during measurement

(48) Displaying the maximum radiation intensity E+

The maximum value for the radiation intensity is stored and displayed during measurement.

To reset the value manually:
- Select a line with the OK key.

(49) Displaying the minimum radiation intensity E-

The minimum value for the radiation intensity is stored and displayed during measurement.

To reset the value manually:
- Select a line with the OK key.

(50) Displaying the average radiation intensity E/

The measuring device calculates the average value for the radiation intensity over the duration of the measuring process.

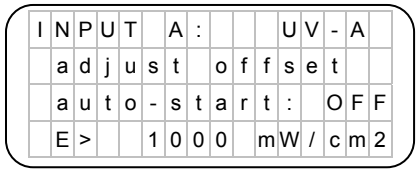
The display E+, E-, /E is only refreshed while measurement is taking place, i. e. the measurement must be started via the START/STOP key or the Autostart function.

3rd measuring menu "adjust offset"

3rd measuring menu "adjust offset"

Changing from the 2nd measuring menu to the 3rd measuring menu "adjust offset":

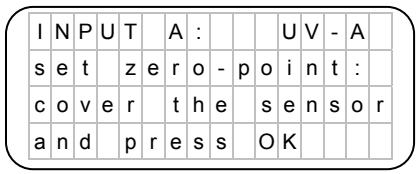
- Press arrow key ▼ until the next menu appears.



- Select menu line "adjust offset", using the arrow keys ▲▼.
- Confirm your selection with the OK key.

The zero point of the measuring device frequently becomes distorted as a result of various factors. In order to achieve precise readings, particularly at high temperatures or with low radiation intensities, it is therefore essential to adjust the offset before proceeding with measurement.

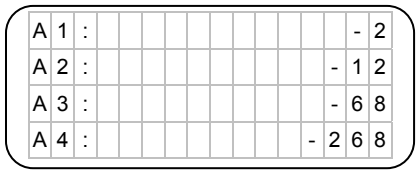
NOTE
It is also necessary to adjust the offset when a sensor is plugged in or replaced. Failure to do so will result in greatly distorted readings.



After selection of the menu line "adjust offset" , the text shown on the left appears.

- Completely cover the corresponding sensor.
- Make sure the connecting cable between the measuring device and the sensor is held immobile.
- Press the OK key again.

The corresponding sensor remains completely covered.



After a short wait, the zero point display appears.

The new zero point is stored in the memory.

- Confirm with the OK key.

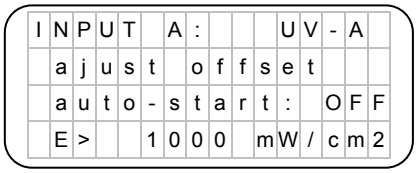
The display of measuring menu 3 reappears.

Autostart function

Autostart function

The Autostart function monitors the current radiation intensity and initiates measurement when a preset limit is exceeded or stops measurement when the value falls more than 10% below the preset limit.
The Autostart function is applied for precise dosage and time measurement. The measuring device triggers the start of the measurement to coincide exactly with the opening of the shutter.

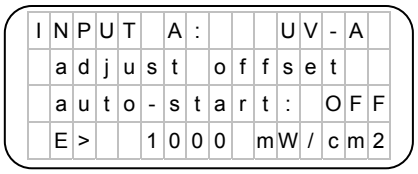
Activating/deactivating the Autostart



Activating/deactivating the Autostart

- Select the menu line "auto-start" using the arrow keys ▲▼.
- Press OK key.

The line "auto-start: ON" appears.



Setting the limit value for the Autostart

Setting the limit value for the Autostart
This line contains the limit value for the Autostart function.

- Select menu line "E> xxxxx mW/cm2" using the arrow keys ▲▼.
- Confirm with the OK key.
- Enter value via arrow keys.
- Confirm with the OK key.
  The entry cursor jumps to the next position.

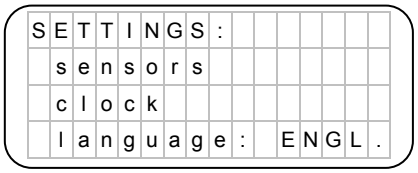
The set value is stored permanently in the memory for each individual sensor and is recalled with each start.
A limit value is defined for each individual sensor, and this value is downloaded automatically from the data memory each time the sensor is connected up. If Autostart is on für at least one chanel, the function of the START/STOP-butten is disabled.

Settings Menue

Settings

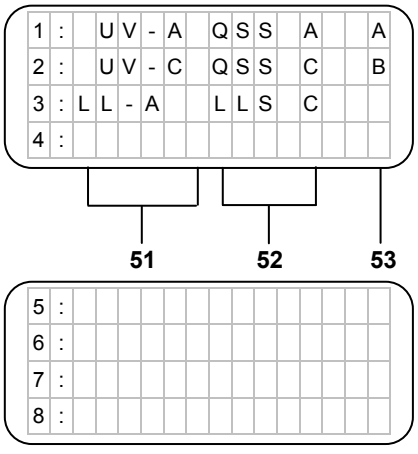
To change from the 1st measuring menu to the "SETTINGS" menu:

- Press the CHANGE DISPLAY key until the settings menu appears.



SETTINGS sensors

SETTINGS: sensors
This menu displays a list of all sensors stored and calibrated in the device.
The data memory can store a maximum of 8 different sensors. These are then automatically recognized by the device when they are plugged in.



Displaying the list of sensors

Displaying the list of sensors

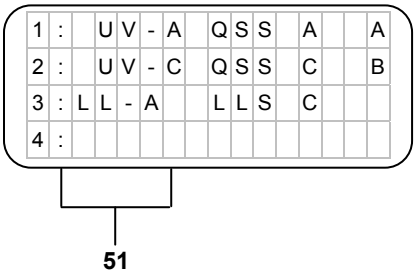
- Select the menu line "sensors", using the arrow keys ▲▼.
- Confirm with the OK key.

The list shows all sensors.

- Using the arrow keys ▲▼, scroll through the list of sensors.

The first part (51) of the sensor designation can be defined by the user, see: "Changing sensor name".
The second part (52) is programmed by the Hönle AG and contains information on the sensor used.
The right-hand side of the display (53) shows which channel the sensor in question has been recognized at.

Changing sensor name

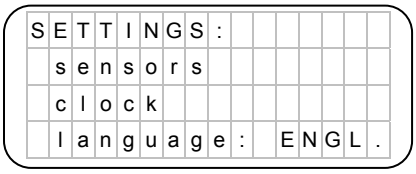


Changing sensor name
The user can enter any 6-character designation (51).

- Select sensor, using the arrow keys ▲▼.
- Confirm with the OK key.
- Use the arrow keys ▲▼ to enter the new designation.
- Confirm with the OK key.

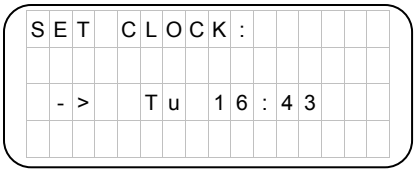
The entry cursor jumps to the next position.

SETTINGS: clock



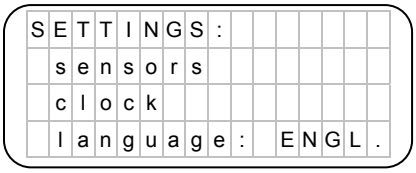
SETTINGS: clock
This menu is used to set the time and the day.
The integrated real-time clock continues running when the device is switched off and has a buffer of approx. 15 hours to allow for easy replacement/charging of batteries.

- Select menu line "clock", using the arrow keys ▲▼.
- Confirm with the OK key.



- Enter using the arrow keys ▲▼.
- Confirm with the OK key.
  The entry cursor jumps to the next entry position.

SETTINGS: language

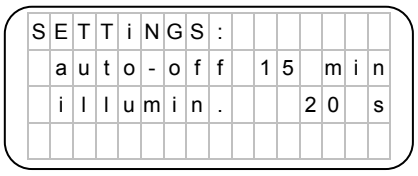


SETTINGS: language
This menu is used to adapt the various menu texts to the desired language.
Languages available at present:
German and English.

- Select the menu line "language", using the arrow keys ▲▼.
- Confirm with the OK key.
- Language selection via arrow keys ▲▼.
- Confirm with the OK key.

Changing from the 1st "SETTINGS" menu to the 2nd "SETTINGS" menu:

- Press arrow key ▼ until the next menu appears.

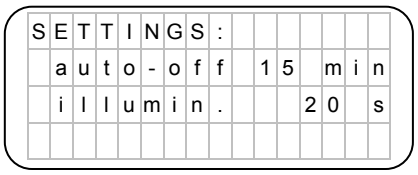


SETTINGS: auto-off

SETTINGS: auto-off

The measuring device switches off automaticallly if a longer period of time elapses without any key being pressed and if no reading is being taken.
The user can set the device to switch off after any period between 1 and 99 minutes. A set value of 0 deactivates the automatic switch-off function.

- Select the menu line "auto-off", using the arrow keys ▲▼.
- Confirm with the OK key.
- Enter value via the arrow keys ▲▼.
- Confirm with the OK key.
  The entry cursor jumps to the next entry position.



SETTINGS: illumin.

SETTINGS: illumin.

In order to save energy, the background illumination is switched off after a preset time has elapsed (after the last time a key was pressed).
Set values:

1 to 98 seconds
99 = continuous illumination
0 = no illumination

- Select the menu line "illumin.", using the arrow keys ▲▼.
- Confirm with the OK key.
- Enter value via the arrow keys ▲▼.
- Confirm with the OK key.
  The entry cursor jumps to the next entry position.

Additional menu windows in the HighEnd version

Additional menu windows in the HighEnd version: Display, function and operation

Data storage memory

Data storage memory

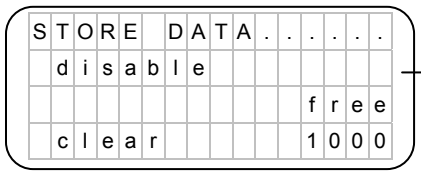
The memory holds a total of 1000 data records. Each data record consists of the following individual values:

Radiation intensity E	Dosage Q
Maximum radiation intensity Emax	Minimum radiation intensity Emin
Average radiation value /E	Identifier
Exposure time t_relative	Time t_absolute
Input channel (A or B)	Sensor name

NOTE
The data storage memory can only be accessed via the optional docking station, see "RS232 terminal".

- CHANGE DISPLAY Press key until the 1st measuring menu "Input A" or "Input B" appears.
- Press arrow key ▼ until the data storage menu appears.

Activating/deactivating data storage and selecting mode



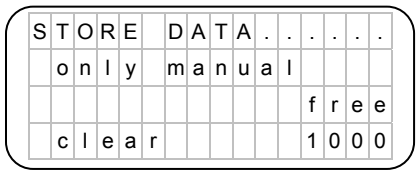
Activating/deactivating data storage and selecting mode

- Select mode line (54) with the OK key.
- Activate/deactivate and select operating mode with arrow keys ▲▼ .
- Confirm with the OK key.

Data storage is possible in 3 different operating modes:

Store data only manual / Store data begin and end / Store data continuous

STORE DATA only manual

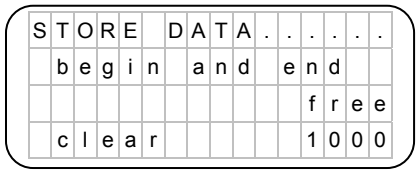


STORE DATA only manual

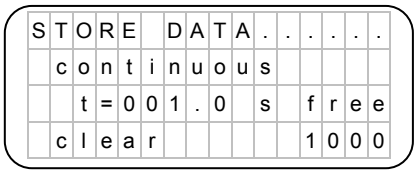
As soon as the STORE DATA key is pressed, the measurement values for this channel are stored in the memory.

The **STORE DATA key** can be pressed at any time, even during measurement.
The user can also assign a measurement number (see" **STORE DATA key"**).

STORE DATA begin and end

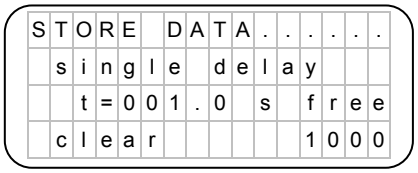


STORE DATA begin and end
In this operating mode, the measurement data is stored in the memory at the beginning and the end of the set interval.
This means that all information relevant to the radiation process is stored in the memory, information such as
starting time, intensity, dosage, exposure time, extreme and average values.



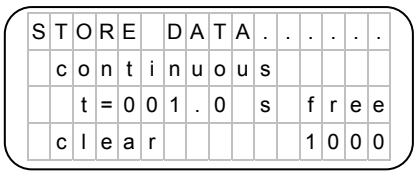
STORE DATA continuous
This operating mode makes it possible to carry out whole series of measurements or to track the radiation intensity over time.
The data records are stored at set interval t until the measurement is concluded.

STORE DATA continuous



STORE DATA single delay
In this operating mode the UV Meter makes only one measurement. After starting the UV Meter waits vor the adjusted time and stores then the date record. Use this mode, if for example the intensity increases after start until reaching the end value.

STORE DATA single delay



Setting the interval / delay
The interval / delay t can be set to any value between 0.1 and 999.9 seconds.

- Select menu line "t =xxx.x s", using the OK key.
- Enter the desired value via the arrow keys ▲▼.
- Confirm with the OK key.
  The input cursor jumps to the next entry position.

Setting the interval

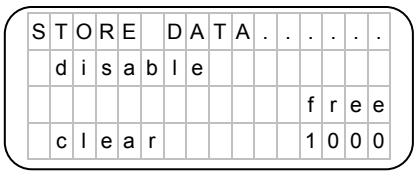
Starting the measuring interval
- Start the measuring process with the START/STOP key

or

- Start via the Autostart function (see "Autostart function").

Starting the measuring interval

NOTE
The storage mode can be set for each channel individually.
If data from only one channel is required, the other channel must be deactivated.



STORE DATA clear
This function completely clears the data storage memory.
It is not possible to clear only selected individual data records from the memory.

- Select the menu line "clear", using the arrow keys ▲▼.
- Confirm with the OK key.

STORE DATA clear

Measuring menu "INPUT B"

Measuring menu "INPUT B"

The UV Meter HighEnd has an additional input channel.
The display, function and operation of measuring menu "INPUT B" are analogue to those of "INPUT A".

Changing from measuring menu "INPUT A" to measuring menu "INPUT B":
- Press CHANGE DISPLAY key.

Autostart function

Autostart function

NOTE
The Autostart function is activated/deactivated separately for each input channel.
If the Autostart function is active for both channels, measurement starts as soon as one of the limit values is exceeded and stops only when the value has fallen below both limit values.

Measuring menu "INPUT A+B"

Measuring menu "INPUT A+B"

Changing from measuring menu "INPUT B" to measuring menu "INPUT A + B":
- Press CHANGE DISPLAY key.

I	N	P	U	T		A	:				U	V	-	A	
	E	=		2	7	5	.	6		m	W	/	c	m	2
I	N	P	U	T		B	:				U	V	-	B	
	E	=		1	2	9	.	3		m	W	/	c	m	2

With this menu, a direct comparison can be drawn between the readings of two sensors connected to the equipment.
It can also be used for simultaneous monitoring of two wavelength ranges or two different positions.

At fabrication, the units mW/cm2, W/cm2 and W/M2 are available.

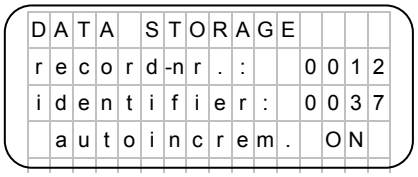
Changing the display unit:
- Select the line with the OK key.

The measurement is effected on both channels in a synchronised manner.
All settings for Autostart or the data storage memory must be effected in the respective individual menus, either in "INPUT A" or "INPUT B".

STORE DATA key: Display, function and operation

STORE DATA key: Display, function and operation

The STORE DATA key is used to store data records manually, either during or between measurements.
The user can assign a measurement number for each reading to allow easy identification of the individual data records.



- Activate the data storage function of the measurement channel, see: "Activating/deactivating data storage"
- Press and hold down STORE DATA key.

record-nr.
record-nr.

This line shows the current data record in the data storage memory, i.e. the storage position of the individual measurement data. This number is increased automatically by the measuring device and reset to 0 when the data memory is cleared.

identifier
identifier

The measurement number (identifier) can be defined by the user before commencement of measurement.

- Press STORE DATA key and hold pressed.
- Select menu line "identifier" with the OK key.
- Release STORE DATA key.
- Enter value, using arrow keys ▲▼.
- Confirm with the OK key.

All subsequently registered data records are assigned this identifier to facilitate later identification.

autoincrem.
autoincrem.

To facilitate the allotment of numbers, there is an autoincrement function.
When a new measurement commences, the number is automatically increased by one.
All subsequent individual data records are assigned the same identifier until the measurement process is stopped again.
When the next measurement is started, the identifier is increased by one. This means that each data record can be identified as belonging to a specific measurement process.

"Freezing" the screen

"Freezing" the screen

The measurement data is not refreshed. Instead, the current display is "frozen".

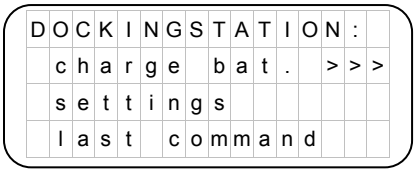
- Deactivate data storage for both channels.
- Press STORE DATA key and hold pressed.

Docking station

Docking station

With the optional docking station, the measuring device can be connected up to a PC via the integrated RS232 interface.
The following menu appears as soon as the measuring device is inserted into the docking station:

DOCKING-STATION: charge bat.



DOCKINGSTATION: charge bat.

Starting the charging process

Starting the charging process

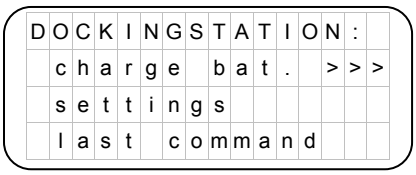
- Select the line "charge bat. >>>", using the arrow keys ▲▼.
- Confirm with the OK key.

The moving arrows show the status of the charging process.
The background illumination is switched off during the charging process, and no measurements can be taken during this time.

ATTENTION
The charging process must never be started if the battery compartment contains normal, non-rechargeable batteries. Doing so would cause the destruction of the measuring device and could even cause the batteries to explode!

NOTE
The charging facility is for NiMH Mignon rechargeable batteries with a capacity of 1300-1800mAh. To prevent damage to the equipment, please ensure that the right batteries are used.

DOCKING-STATION: settings

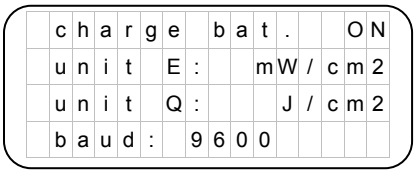


DOCKINGSTATION: settings
This menu is used to enter settings for the docking station.

- Select menu line "settings" with the arrow keys ▲▼.
- Confirm with the OK key.

The following menu appears:

charge bat. ON/OFF

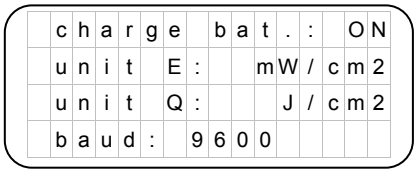


charge bat. ON/OFF
This menu is used to activate/deactivate the battery charging function. This is necessary if normal batteries are used.

- Select menu line "charge bat." with the OK key.

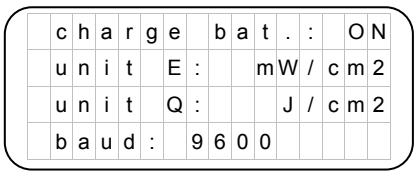
If the charging function is deactivated, the item "charge bat." in the main menu can no longer be selected.

unit E / unitQ



unit E / unitQ
Here, the units for the measurement data read off via the RS232 are set. These units apply both for the data storage memory and the values for current measurement read off via the RS232 interface.
On fabrication, the units mW/cm2, W/cm2, W/M2 and mJ/cm2, J/cm2, kJ/cm2 are available.

- Select menu line "unit E" or "unit Q", using the arrow keys ▲▼.
- Confirm with the OK key.
- Select the desired unit via the arrow keys ▲▼.
- Confirm with the OK key.

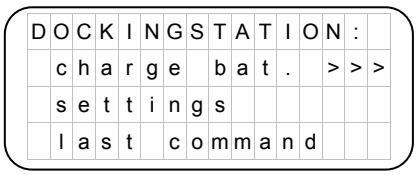


baud

baud
Here, the user can enter the desired baud rate for data transmission.
The measuring device can transmit data at the following baud rates:
4800, 9600, 19200, 57600 and 115200.
The set rate must be identical in the PC terminal programme and in the measuring device itself.

- Select the menu line "baud", using the arrow keys ▲▼.
- Confirm with the OK key.
- Selection via arrow keys ▲▼.
- Confirm with the OK key.

NOTE
A baud rate of 9600 is recommended.



DOCKING-STATION: last command

DOCKINGSTATION last command
This menu item repeats the last command for reading the content of the data storage memory.
This function facilitates reading from the data storage memory, as it is thus not necessary to enter the complete format string (see "RS232 terminal commands").

- Select mode "last command", using the arrow keys ▲▼.
- Confirm with the OK key.

Changing from the "DOCKINGSTATION" menu to measuring menu "INPUT A":

- Press CHANGE DISPLAY key.

RS232 terminal commands

RS232 terminal commands

General information

General information

Any terminal programme can be used as a communication programme with the PC (e.g. the Hyper-Terminal programme which forms part of the Windows package).
The docking station is connected up to a vacant COM-port on the PC using a 9-pole Sub-D lead (1:1 socket).

Set the transmission parameters as follows in the terminal programme:

- 8 Data bits
- 1 stop bit
- no parity
- baud rate: 4800, 9600, 19200, 57600, depending on the setting on measuring device

NOTE
The same baud rate must be set in the PC terminal programme and the measuring device.

Each command consists of a text string with parameters.
Spaces or other special characters between the parameters are not permissible and cause malfunctions.
Each command must be terminated with CR/LF (Enter key).

All valid characters are echoed by the measuring device (ECHO function) so that the entry can be monitored in the PC terminal programme.
When the ESC key (ASCII 27) is pressed, the receiving buffer is cleared and a new command can be entered.
In the case of automatic reading processes, it is advisable to preface each command with ASCII 27.
The ESC key must also be pressed if a faulty entry is made - it is not possible to make corrections with the backspace or the Del key.
By sending the ASCII 26 character the UV Meter exits the Dockingstation-Menue

Overview of commands

Overview of commands

Command	Parameter	Description	Example
ACTA*x*	See table	Transmit current value channel A	ACTAE
ACTB*x*	See table	Transmit current value channel B	ACTBT
Fexyz	x = Unit (1 to 3) y = Designation (6 characters) z = Conversion factor	Definition of display unit E	FE1mW/cm21.00
Fqxyz	x = Unit (1 to 3) y = Designation (6 characters) z = Conversion factor	Definition of display unit Q	FQ3mJ/cm21.00
RUN		Start measurement	
SEN		Sensor list	
SETOFFSETA		Offset setting channel A	
SETOFFSETB		Offset setting channel B	
STOP		Stop measurement	
STORE		Simulation STORE-DATA key	
TABformatstring	See table	Read data storage memory	TABEQT
UNITE*x*	x = Unit (1 to 3)	Set display unit E for RS232	UNITE2
UNITQ*x*	x = Unit (1 to 3)	Set display unit Q for RS232	UNITQ3

RS232 terminal commands: Detailed description

There follows a list of RS232 terminal commands in alphabetical order, described as per table "Overview of commands".

ACTA Measurement data from channel A

Measurement data from channel A

Command: ACTA*data designation*

ACTB Measurement data from channel B

Measurement data from channel B

Command: ACTB*data designation*

Reading off measurement data online
When the measuring device is in the process of taking measurements, the current measurement data can be read off via the RS232 and, for example, processed in real time with a PC or a PLC.

NOTE
After placing the equipment in the docking station, the CHANGE DISPLAY key must be pressed to access the measuring menu.
Alternatively you can send ASCII 26

Data designation
The letter stands for the data output the measuring device is to produce.

Data designation	Data output
C	Input channel (A or B)
E	Radiation intensity
H	Maximum intensity
K	Exposure time in seconds
L	Minimum intensity
M	Average intensity
N	Identifier
O	Fault status
Q	Radiation dosage
R	Exposure time in format hhh:mm:ss.s
S	Sensor designation
T	Time plus day

NOTE
The command produces the purely numeral value without unit as an ASCII symbol.
The display unit can be altered in the docking station settings menu or via the command UNITE or UNITQ.

EXAMPLE The command ACTAE results in feedback of the current radiation intensity in channel A.

```
ACTAE
823,5
```

FE Changing the conversion factor for display units E

Changing the conversion factor for display units E

Command: FE*LocationDesignationFactor*

FQ Changing the conversion factor for display units Q

Changing the conversion factor for display units Q

Command: FQ*LocationDesignationFactor*

The measuring device registers all readings in mW/cm2.
If necessary, different display units can be used.
Conversion to the set display unit takes place automatically. Corresponding conversion factors can be stored for this purpose.
There are 3 storage locations each for E and Q.

Location = *Number 1 to 3*
Designation = *Unit of display*
There must always be exactly 6 characters at this position.
It may be necessary to insert spaces.
Factor = Conversion factor for converting mW/cm2 to the new display unit.

Display units for E		**Pre-setting**	
Number	*Location*	*Designation*	*Factor*
1	1. Display unit E	mW/cm2	1
2	2. Display unit E	W/cm2	0.001
3	3. Display unit E	W/M2	10

Display units for Q		**Pre-setting**	
Number	*Location*	*Designation*	*Factor*
1	1. Display unit Q	mJ/cm2	1
2	2. Display unit Q	J/cm2	0.001
3	3. Display unit Q	kJ/cm2	0.000001

EXAMPLE FE1mW/dm2100
This command sets a display unit with the designation mW/dm2 at location 1 and defines a conversion factor of 100.

NOTE
The designation entered must always consist of 6 characters, as otherwise the conversion factor can be misinterpreted.

RUN
Starting measurement

Starting measurement

Command: RUN

Starting measurement online
It is also possible to start a measurement via the RS232.
This function simulates the pressing of the START/STOP key, thus allowing remote-controlled and automated measurement, for example via a PLC. To do this, the measuring device must already be in the measuring menu.

NOTE
After placing the equipment in the docking station, the CHANGE DISPLAY key must be pressed to access the measuring menu.
Alternatively you can send ASCII 26

SEN
Displaying all available sensors

Displaying all available sensors

Command: SEN

A list of all available sensors is transmitted via the RS232.
In this way, the user can see which sensors have been calibrated and which sensors are connected up at the moment.

SETOFFSETA
Adjusting offset channel A

Adjusting offset channel A

Command: SETOFFSETA

SETOFFSETB
Adjusting offset channel B

Adjusting offset channel B

Command: SETOFFSETB

This command enables offset adjustment. Before issuing the command, it must be ensured that the sensor is completely covered so that the device zero point can be redefined.

STOP Stopping measurement

Stopping measurement

Command: STOP

Stopping measurement online
It is also possible to stop a measurement via the RS232.
This function simulates pressing the START/STOP key and allows remote-controlled and automated measurement, for example via a PLC. The measuring device must already be in measuring menu and an interval for the measurements active.

NOTE
After placing the equipment in the docking station, the CHANGE DISPLAY key must be pressed to access the measuring menu. Alternatively you can send ASCII 26

STORE Simulation of the STORE-DATA key

Simulation of the STORE DATA key

Command: STORE

This function simulates pressing the STORE DATA key. The current measurement data is stored in the memory.
The data storage function must first be activated via the storage menu, see "Data storage memory, Activating/deactivating and selection of mode".

TAB Transmitting stored data to a table

Transmitting stored data to a table

Command: TAB(A or B)*Format string*

The transmission command always begins with the command TAB**.**
A channel filter can be set by means of the optional characters A or B. In this way, only the data records from the corresponding channel are entered in the table.

Format string
The format string consists of a sequence of letters.
The letters stand for the individual column designations and contents in the table to be drawn up.
The command must not exceed 15 characters in length.

Letter	Column designation	Column content	Column width
C	CH	Input channel (A or B)	6
E	E [Unit]	Radiation intensity	12
H	Emax [Unit]	Maximum intensity	15
K	dt [sec.]	Exposure time in seconds	14
L	Emin [Unit]	Minimum intensity	15
M	E ave [Unit]	Average intensity	15
N	NR	Identifier	8
O	STAT	Fault status	8
P	POS	Running number of lines	8
Q	Q [Unit]	Radiation dosage	12
R	dt (t_rel)	Exposure time in format hhhmmss.s	14
S	SENSOR	Sensor designation	10
T	TIME (t_abs)	Time with day	16

EXAMPLE

TABAPER
This command generates a table of the intensity, seen over time, of channel A.

```
POS:    E [mW/cm2]   dt (t_rel)
00000    50.46       000:00:00.0
00001    50.46       000:00:01.0
00002    50.46       000:00:02.0
```

The stored data is transmitted in the form of a text spreadsheet with a fixed column width which can then be imported to another programme (e. g. Microsoft® Excel) for further evaluation.

NOTE
The decimal point is used (ASCII 46).
The evaluation software (e. g. Microsoft® Excel) must be configured accordingly.

NOTE
The display unit of the generated measurement data can be altered in the docking station settings menu or by means of the command UNITE or UNITQ.

Changing display units E

UNITE Changing the conversion factor for display units E

Command: UNITE*Number*

Changing display units Q

FQ Changing the conversion factor for display units Q

Command: UNITQ*Number*

The display unit of the measurement data transmitted via the RS232 is altered.
The display unit for the display screen remains unchanged.

Location = *Number 1 to 3*

Display units for E		**Pre-setting**	
Number	*Location*	*Designation*	*Factor*
1	1. Display unit E	mW/cm2	1
2	2. Display unit E	W/cm2	0.001
3	3. Display unit E	W/M2	10

Display unit for Q		**Pre-setting**	
Number	*Location*	*Designation*	*Factor*
1	1. Display unit Q	mJ/cm2	1
2	2. Display unit Q	J/cm2	0.001
3	3. Display unit Q	kJ/cm2	0.000001

NOTE
The designation and the factor stored in the individual locations can be changed with the command FExyz or Fqxyz, see "Changing the conversion factor for display units E" or "Changing the conversion factor for display units Q".

8. Servicing, maintenance and cleaning

General Information

General Information

Servicing, maintenance and cleaning work must be carried out by authorised personnel only.

Servicing

Servicing

Both the UV Meter BASIC and the UV Meter HighEnd are service-free.

The docking station also requires no servicing.

In time, the storage capacity of the rechargeable batteries in the UV Meter HighEnd may decrease. It may be necessary to replace the rechargeable batteries if they are exhausted within a short time after charging.

NOTE
New batteries can be obtained from the Hönle AG, see "Order data for equipment, spare parts and accessories; Spare parts".

NOTE
Spent batteries should never be placed in the usual rubbish, but must be disposed of in an environment-friendly manner at local waste collection centres.

Maintenance

Maintenance

Replacing batteries or rechargeable batteries

Replacing batteries or rechargeable batteries

In the lower part of the Hönle UV Meter, there is a separate battery compartment to provide a mobile power supply. The compartment takes rechargeable batteries or batteries of size Mignon AA.

UV Meter BASIC

The UV Meter BASIC is delivered complete with a set of 6 Mignon AA batteries.

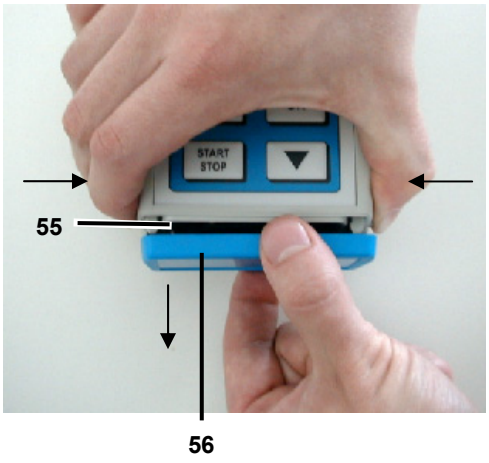
NOTE
Non-rechargeable battereies must be removed immediately from the measuring device once they are spent.

NOTE
Spent batteries should never be placed in the usual rubbish, but must be disposed of in an environment-friendly manner at local waste collection centres.

NOTE
Rechargeable batteries can also be used in the UV Meter BASIC. A separate docking station can be ordered, or alternatively, the rechargeable batteries can be removed from the battery compartment and charged in an external charging device.

The UV Meter HighEnd is delivered complete with a set of 6 NiMH Mignon rechargeable batteries. These rechargeable batteries can be charged via the docking station without it being necessary to remove them from the device.

NOTE
The charging function is for NiMH Mignon rechargeable batteries with a capacity of 1300-1800mAh. Always use rechargeable batteries of the correct type to prevent damage to the equipment.



Opening the battery compartment (55)

- Remove the blue cover (56) from the bottom of the device.

To do this:

- Press the buttons on the sides together firmly while pulling the cover off in a downwards direction.

- Remove the battery case (57).
- Remove the batteries or rechargeable batteries which are to be replaced.
- Load the battery case (57) with the new or charged batteries, paying attention that the poles are pointing in the right directions.
- Slide the battery case (57) back into the battery compartment.
- Replace the blue cover (56).

Cleaning

Cleaning

NOTE
Never use aggressive or abrasive cleaning agents.

Cleaning the sensors

Cleaning the sensors

If the equipment is used in dust-laden environments or in the presence of adhesive vapour, the sensor surface of the light guide can become soiled, thus impairing measurement.

- Clean sensor measuring heads with a clean, lint-free cloth moistened with alcohol or acetone.
- Never immerse sensor measuring heads in water or other liquids.

Cleaning the surface

Cleaning the surface of the equipment

Use only mild cleaning agents containing tensides (e.g. household cleaning agents), cleaning wipes or a damp sponge to clean the surface of the equipment. Never allow moisture to penetrate into the interior of the equipment.

9. Faults

General information

General information

Should faults occur during operation of the UV Meter, obey the following instructions to locate the cause of the fault. Tips will also be given on how to remedy the fault.

If a fault occurs on your equipment and cannot be remedied by following these instructions, please contact the customer service department of the Dr. Hönle AG.

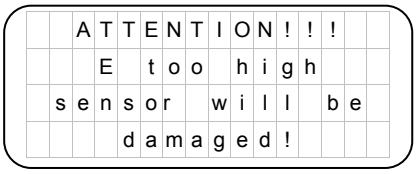
Contact address:

Dr. Hönle AG
UV-Technologie
Lochhamer Schlag 1
D-82166 Gräfelfing / München

Tel.: +49 (0)89 / 856 08-0
Fax: +49 (0)89 / 856 08-148

Fault messages

Fault messages



The maximum radiation intensity for one of the sensors has been exceeded.

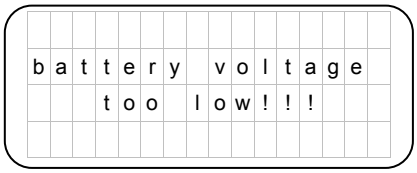
- Reduce the radiation intensity immediately

or

- Remove the sensor from the radiation channel.

This message will disappear as soon as the intensity is within the normal range again.

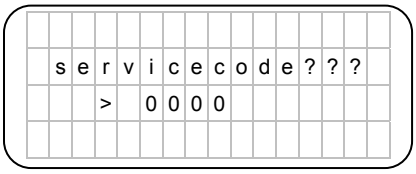
ATTENTION
Danger of irreversible damage to the sensor!



The batteries/rechargeable batteries are so far discharged that reliable measurement data is no longer ensured.

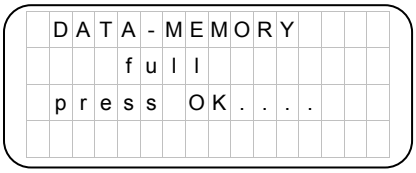
- Replace batteries immediately.
- Charge rechargeable batteries via the docking station.

As soon as the UV Meter is placed in the docking station, the power supply is provided via the external power supply module and the equipment is fully ready for use again.

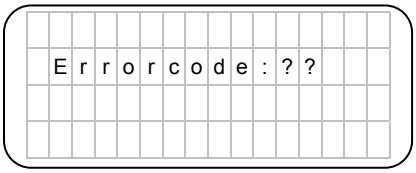


A hidden function has been selected.
This function is reserved exclusively for the use of service technicians.

- Press the OK key until the message disappears.



The data storage memory is full.
No further measurement data can be stored until the data has been transferred to the PC and the memory cleared.
If the OK key is pressed, measurement is effected as normal, but without storage of data.



Instead of the ??, there is a number which can provide information on the fault which has occurred. As soon as this fault message appears, switch the measuring device off and then back on again.
If this fault occurs constantly, contact our customer service department, see "General information; Contact address".

Fault list

Fault list

Fault	Cause of fault	Remedial action
UV Meter will not start.	The batteries or rechargeable batteries are flat.	• Replace batteries, see "Servicing, maintenance and cleaning; Replacing batteries/rechargeable batteries". • Charge rechargeable batteries via the docking station, see; "Menus; Menu windows; Display, function and operation; Docking station settings; Charging rechargeable batteries". • Charge rechargeable batteries via external charging device.
The status LED on the docking station does not light up.	Mains plug is not plugged in. Mains socket bears no current.	• Connect mains plug, see "Setting up, commissioning and operation; Power supply for the docking station". • Check main fuse.

Fault	Cause of fault	Remedial action
The UV Meter switches off during operation.	AutoPowerOff function: To save energy, the equipment switches off after a predefined time.	• Press any key. The AutoPowerOff time is now extended by the preset time. • Set the AutoPowerOff to a higher time interval, see: "Menüs and RS232 terminal commands; Menu windows; Settings". • Place UV Meter in docking station. This deactivates the AutoPowerOff function.
Sensors are not correctly identified. "Sensor fault" or "No sensor" appears on the display instead of measurement data.	Sensor does not belong with this measuring device. Sensor identification not functioning. Battery charge too low. Rechargeable battery charge too low. Sensor or calibration data has been deleted from the memory of the measuring device.	• Connect up correct sensor. The serial number of the measuring device and the sensor must be identical. • Insert plug in socket, see: "Setting up, commissioning and operation; Connecting up sensors". • Replace batteries, see "Servicing, maintenance and cleaning; Replacing batteries or rechargeable batteries". • Charge batteries. See: "Menüs and RS232 terminal commands; Additional menu windows in the HighEnd version; Docking station". • Contact the customer service department. See : "General information; Contact address".
The UV Meter shows a measurement on the display screen although the sensor is not exposed to radiation.	Zero point displacement influenced by temperature and environment.	• Adjust the zero point. See: "Menus and RS232 terminal commands; Menu windows. 3rd measuring menu offset adjustment".
The screen shows the wrong time.	The real time clock has been reset due to a failure in the power supply.	• Set the time again. See: "Menus and RS232 terminal commands; Menu windows; Setting the time".
The measuring device starts a measurement process, although the START/STOP key has not been pressed.	The AutoStart function has initiated a measurement automatically.	• Deactivate the AutoStart function. See: "Menus and RS232 terminal commands; Menu windows; AutoStart function" and "Menus and RS232 terminal commands; Additional menu windows; Autostart function".

Fault	Cause of fault	Remedial action
No data is stored in the data storage memory although the STORE DATA key has been pressed.	Storage mode is deactivated. Data storage memory is full.	• Set storage mode to "manual only". See: "Menus and RS232 terminal commands; Additional menu windows; Data storage memory". • Read off data storage memory and then release with function "Delete memory". See: "Menus and RS232 terminal commands; Additional menu windows; Data storage memory".
The measurement data is not stored although the display shows storage mode.	Storage mode for the corresponding channel is deactivated. Data storage memory is full.	• Storage mode must be activated separately for each channel. See: "Menus and RS232 terminal commands; Additional menu windows; Data storage memory". • Read off data storage memory and then release with function "Delete memory". See: "Menus and RS232 terminal commands; Additional menu windows; Data storage memory".
The device cannot be switched off with the OFF key when it is located in the docking station.	The device cannot be switched off when it is in the docking station.	• Remove device from the docking station.
The function "Charge bat." in the docking station menu has been selected, but the status LED remains green and the charging process does not start.	Battery charging function is deactivated.	• Activate battery charging function. See: "Menus and RS232 terminal commands; Additional menu windows for UV Meter HighEnd; Docking station".

Fault	Cause of fault	Remedial action
No communication between docking station and PC. Commands issued are not displayed in the terminal programme (ECHO function).	No connection	• Check RS232 lead between PC and docking station. • Remove UV Meter from the docking station and then insert it again (RESET of the interface).
	Incorrect interface setting	• Correct the interface selection on the PC (COM1 / COM2). See: "Appendix; Using the HyperTerminal; Breif description of configuration and operation; Setting up the connection".
	No power supply to the docking station	• Connect power supply module to docking station. See: "Setting up, commissioning and operation; Power supply to the docking station".
	Wrong baud rate	• The baud rate in the docking station setting menu and the terminal programme must be identical. See: "Menus; Menu windows: Display, function and operation; Docking station settings; Baud" and "Appendix; Using the HyperTerminal; Brief description of configuration and operation; Setting up the connection".

10. Order data for equipment, spare parts and accessories

Ordering

Ordering

Spare parts can be ordered from our spare parts service under the following address:

Contact address:

Dr. Hönle AG
UV-Technologie
Lochhamer Schlag 1
D-82166 Gräfelfing / München

Tel.: +49 (0)89 / 856 08-0
Fax: +49 (0)89 / 856 08-148

UV Meter

UV Meter

Description	Article / Order number
UV Meter BASIC. complete	16501
UV Meter HighEnd, complete	16502
Docking station	16510

Sensors

Sensors

Sensor designation	Spectrum sensitivity	Max. sensitivity	Intensity range	Article / Order number
FS UV-C D1	230 - 285 nm	270 nm	100 - 2000 mW/cm²	16403
FS UV-C D0	230 - 285 nm	270 nm	1 - 200 mW/cm²	16420
FS UV-B D1	290 - 330 nm	310 nm	100 - 2000 mW/cm²	16402
FS UV-B D0	290 - 330 nm	310 nm	1 - 200 mW/cm²	16419
FS UV-A D1	330 - 400 nm	360 nm	100 - 5000 mW/cm²	16401
FS UV-A D0	330 - 400 nm	360 nm	1 - 200 mW/cm²	16418
FS VIS D1	380 - 550 nm	470 nm	100 - 2000 mW/cm²	16404
FS LED D1	265 - 485 nm	365 - 410 nm	100 – 20 000 mW/cm^2	38677

Sensor designation	Spectrum sensitivity	Max. sensitivity	Max. radiation intensity	Article / Order number
LLS UV-C D1	230-285 nm	270 nm	20 W/cm2	16407
LLS UV-A D1	330-400 nm	310 nm	20 W/cm2	16406
LLS LED D1	265 – 485 nm	364- 410 nm	100 – 20 000 mW/cm2	45619

Sensor designation	Spectrum sensitivity	Max. sensitivity	Max. radiation intensity	Length	Article / Order number
QSS UV-C D0	230 - 285 nm	270 nm	20 W/cm²	**80 mm**	16411
				146mm	19906
				260 mm	16409
QSS UV-A D0	330 - 400 nm	360 nm	20 W/cm²	**80 mm**	16410
				146 mm	16417
				260 mm	16408

Other sensor types are available on request.

Optional Dockingstaion

Optional Dockingstation

Dockingstation, power-supply, cable, RS232-connection	16508

Calibration

Calibration

Description	Article / Order number
Calibration for the first sensor	16551
Calibration for every additional sensor	16552

Spare parts

Spare parts

	Description	Article / Order number

	Description	Article / Order number
BASIC	UV Meter, calibrated	16461
	Suitcase	16511
	Battery Mignon 1.5 V (6 are required)	2895
HighEnd	UV Meter, calibrated	16462
	Suitcase	16512
	Docking station	16510
	Power supply module	16523
	Mains lead with European plug	16298
	RS232 lead	16266
	NiMH rechargeable battery, 1.5 V (6 are required)	16265

ATTENTION
Use only original spare parts manufactured by the Dr. Hönle AG. Safe operation of the UV METER cannot be guaranteed if spare parts from other manufacturers are used.

Accessories

Accessories

Description	Article / Order number
Protective goggles Typ 3 tinted	0067
Protective goggles Typ 4 clear glass	0682
User’s manual	16520

11. Technical data

Measurements and weight

Measurements and weight

	Width [mm]	Depth [mm]	Height [mm]	Weight [g]
UV Meter	110	49	204	540 incl. batteries
Docking station	100	50	150	230

	Spacing of bores
Wall mount for docking station	82 x 138 mm

Electrical data

Electrical data

UV Meter

UV Meter

Battery operation	6x Mignon cell (AA)
Rechargeable battery operation	6x NiMH rechargeable Mignon 1300-1800 mAh
Mains operation via docking station without / with background illumination	12 V 20 mA/140 mA

Docking station power pack

Docking station power pack

Input voltage range	100 –240 V 50 –60 Hz 300 mA
Mains connection	IEC 60320 C8 standard plug

Using the HyperTerminal

12. Appendix

Using the HyperTerminal

A terminal programme is required for reading the measurement data.
We recommend the HyperTerminal programme, which is part of the Windows package.

Brief description of configuration and operation

Brief description of configuration and operation

58

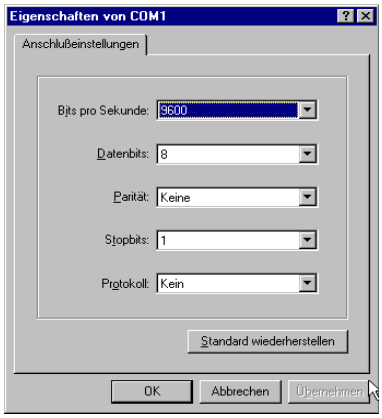
Setting up the connection

The programme can be found in the Start menu under Program /Accessories / Communications / Hyperterminal. After starting the file Hyperterminal.exe, the window "New Connection" appears.

- Enter a name for the new connection in the input window "Name" (e. g. UV Meter).
- Click on the symbol in the symbol field (58).

The selection window "Connect to" opens.

- Select interface "COM 1" or "COM 2" in the field "Connect to", depending which interface of the PC the docking station is connected to.



The selection window "Port settings" opens.

Bits per second

- Select baud rate.
  Same selection as in menu "Docking station; Settings; Baud" of the UV Meter (Standard setting: 9600).
- Select all other parameters as per adjacent screenshot.

The measuring device can now be operated via the terminal window.

NOTE
To test the connection, simply enter a few lines via the keyboard. The characters are then echoed by the measuring device and displayed in the terminal window.
If the characters do not appear in the terminal window, the connection and the configuration must be inspected and correctly set up.

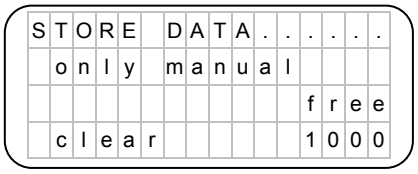
Examples for operation

Examples for operation

1st example

1. Example: Assigning a measured value to a particular work station

In a production plant, the radiation intensity is to be monitored and documented regularly at several work stations.
In order to do this, first carry out measurement at all work stations and read off the data from the data storage memory on the PC.
It should be possible to define which work station a particular measured value was recorded at.

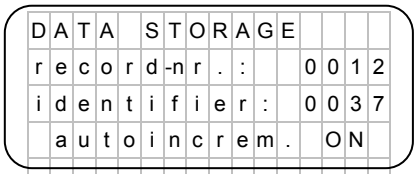


Configuration of the measuring device

- Plug in sensor.
- Set storage mode for the corresponding channel to "manual" in the measuring menu.

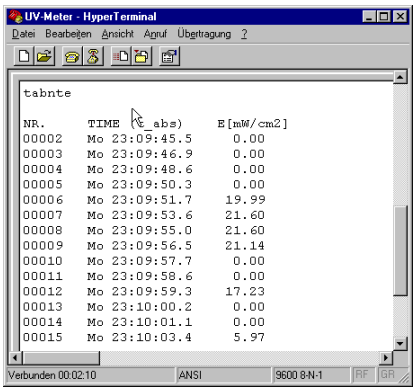
If only one sensor is connected, the storage mode for the other channel must be deactivated.

- Reset the data storage memory by selecting the menu item "clear".



Storing measurement data and assigning work station numbers

- Expose sensor to radiation.
- Hold STORE DATA key pressed.
- Enter a work station number in the identifier line.
- Activate function "Increase".
  The identifier increases automatically by one after each measurement.



Reading the data from the data storage memory

- Place measuring device in docking station.
- Configurate terminal programme.

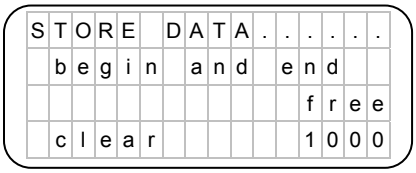
The log table should contain the work station number, the intensity and the time.

- Enter command "TABNTE" to read the data from the data storage memory.

2nd example

2. Example: Measuring several process parameters with AutoStart and reading the results on the PC

At a work station in a production plant, the process parameters (radiation intensity, time, dosage, extreme values, average value) must be monitored and documented. In order to achieve this, an entire radiation sequence is measured at regular intervals and the data stored in the memory. The AutoStart function is to be applied for precise measurement of the exposure times. The data collected is to be read and documented on the PC.

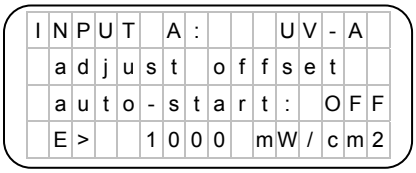


Configuration of the measuring device

- Plug in sensor.
- Set storage mode for the corresponding channel to "begin and end" in the measuring menu.

If only one sensor is connected, the storage mode for the other channel must be deactivated.

Reset the data storage memory by selecting the menu item "clear".



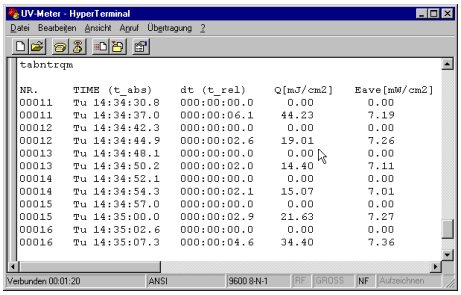
Configuration of the AutoStart function

The exposure time is to be measured when a certain limit value is exceeded.

- Activate the AutoStart function in the measuring menu for the corresponding input channel.
- Set the desired limit value E>.

Carrying out measurements

As soon as the set limit value is exceeded, the UV Meter automatically starts a measurement process and registers the time and the dosage.
2 data records are then stored in the data storage memory (at the beginning and at the end of the measurement).



Reading the data in the data storage memory

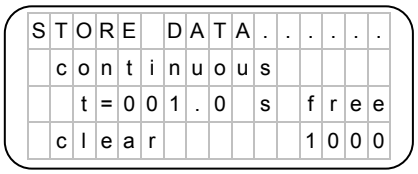
- Place measuring device in docking station.
- Configurate terminal programme.
- Enter command "TABNTRQM" to read the content of the data storage memory.

The log table contains two lines for each measurement. These two lines have the same identifier.
The first line contains
the radiation level and the time;
The second line contains
the extreme values, the dosage and the overall time.

3. Example: Measurement at intervals, reading data on the PC and importing the log to Microsoft® Excel

3rd example

The intensity of the radiation over time is to be registered automatically and the series of measurements then imported to Microsoft® Excel.



Configuration of the measuring device

- Plug in sensor.
- Select storage mode "continuous" in the measuring mode for the corresponding channel.
- Enter interval time t.

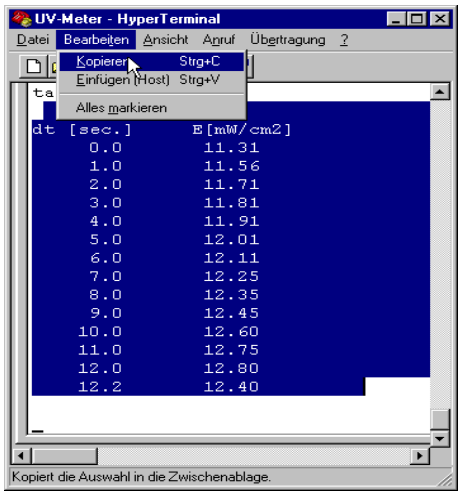
If only one sensor is connected, the storage mode for the other channel must be deactivated.

Reset the data storage memory by selecting the menu item "clear".

Carrying out measurement

- Press START/STOP key.

The measuring process starts/stops.



Reading data from the data storage memory

- Place measuring device in docking station.
- Configurate terminal programme.
- Enter command "TABKE" to read the content of the data storage memory.

The data on the radiation intensity as a function of time is transferred from the storage memory.

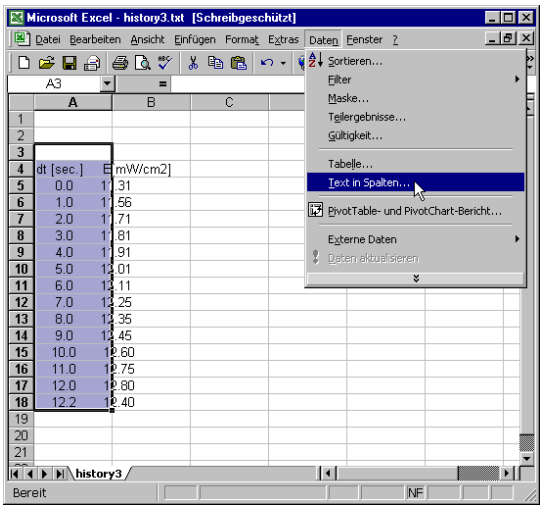
Exporting data

- Highlight table with the mouse.
- Copy to the clipboard with menu "Edit/Copy".

Importing to Microsoft® Excel

- Copy table from the clipboard, inserting it into a Microsoft® Excel folder with the menu "Edit/Insert".

Conversion to Microsoft® Excel data



The table is in the form of ASCII data.

- Convert using the function "Text in columns" in the "Data" menu.
- Enter the point as the decimal separator.
  You will find more detailed information on this in the Online-Hilfe of Microsoft® Excel.