FLUO DX preliminary User Manual

Contents

The FLUO DX invisible ink colorimeter

The FLUO DX Invisible ink colorimeter is the ideal Device to control the use of invisible and phosphorescent inks in the press room. The FLUO DX is equipped with two UV LEDs, at 365nm and 256nm and measures the Fluorescent Intensity, the Colorimetric parameters XYZ, xy, Lab, LCh and the Phosphorescent characteristics of an ink.

Important: This manual describes the current version of the FLUO DX hardware and software. Future enhancements or modifications are reserved.

Safety Instructions

For safety reasons, it is absolutely necessary to read the entire user's guide and all of the instructions it contains. If the safety recommendations and instructions in this User Guide are not complied with, measurement errors or data loss or physical injury or property damage may result.

The FLUO DX is not intrinsically safe. Therefore, the device cannot be used in an environment with explosive vapors where there is a risk of spark ignition or in an area with strong electromagnetic fields. It should be protected against chemicals, corrosive vapors, strong mechanical vibrations and impacts

The FLUO DX is equipped with UV LEDs. Never Ever look directly into the Aperture of the device while on UV LED is turned on! UV Light might hurt your eyes!

Use the FLUO DX in ambient temperatures between 20°C(68°F) and 25°C (77°F), and do not expose the device to direct sun light.

The FLUO DX should never be opened as there are no user-serviceable parts inside. Doing so voids the guarantee. Contact your authorized dealer if repairs are necessary.

To avoid incorrect handling, the FLUO DX should only be used by trained personnel.

Use original PERET spare parts and accessories only.

Use the original packaging exclusively when transporting.

DECLARATION OF CONFORMITY

The undersigned representing the following manufacturer: PERET GmbH/S.r.L, Forch Str. 6, 39042 Vahrn, ITALY herewith declares that the product FLUO DX is in conformity with the provisions of the following CE directives including all applicable amendments:

77/23/EEC Electrical equipment for use within specified voltage limits.

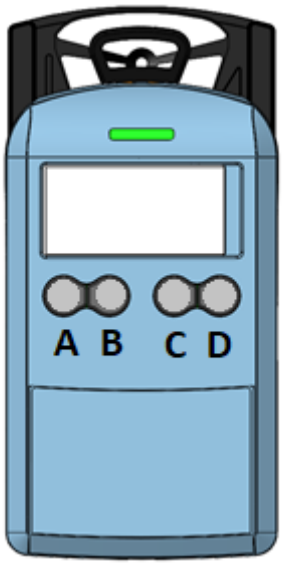
89/336/EEC Electromagnetic compatibility and the standards and technical specifications referenced overleaf have been applied.

Vahrn, December 2017

PERET GmbH
Vahrner See Weg 17
I-39040 Vahrn-Varna
UID: IT02646920211

Konrad Silbernagl, COO of PERET GmbH/Srl

This Manual

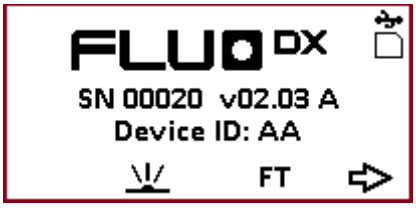


The manual describes the functions of the Device using a A,B,C,D labelling of the keys. A is the left most key, D the right most key.

HARDWARE RESET of the DEVICE

On the bottom of the device you can find the RESET key. Press this key to perform a Hardware RESET.

After a Hardware Reset the FLUO DX will show the key information about the device such as Serial Number, Firmware version, Device ID.



Key B: Transfer measurement data via IR-Interface to the Host PC.

Key C: Perform a Function test of the device.

Key D: Next screen

Device Status information

Whenever appropriate the device status information will be displayed on the right top corner:

USB is connected.

Data memory used, empty to full.

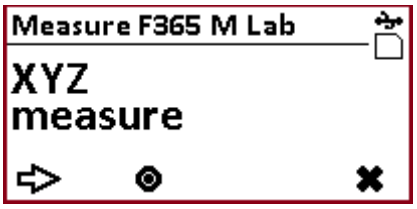
Battery empty, change Batteries.

Battery nearly empty. Change battery at the end of the measurement sequence.

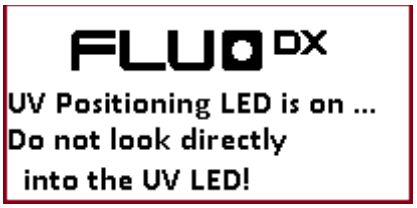
Battery still ok.

Positioning LED

Whenever the device is in measurement mode you can use the positioning LED in front of the device to find the measurement position on the invisible ink. Press and hold Key B. The positioning LED will go off upon release of Key B or after 20 seconds.



Never ever look directly into the UV positioning LED as this might hurt your eyes. The device display shows a proper warning.

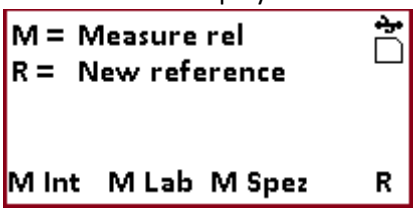


In order to turn the positioning LED on, the following conditions have to be met;

- Device is in the flat position.
- Device is not in the measurement position but in parking position.
- After 20 seconds on, the UV positioning LED turns off. In order to switch it on again release and press Key B. Release Key B to switch the positioning LED off.

Start Display

After the reset display or when returning from any other mode, the Start display is shown.



Key A: Measure the intensity of the Fluorescence or Phosphorescence signal.

Key B: Laboratory functions (Colorimetric measurements, Phosphorescence curve)

Key C: Special Functions (Delta E measurement)

Key D: Measure references for Intensity Measurements.

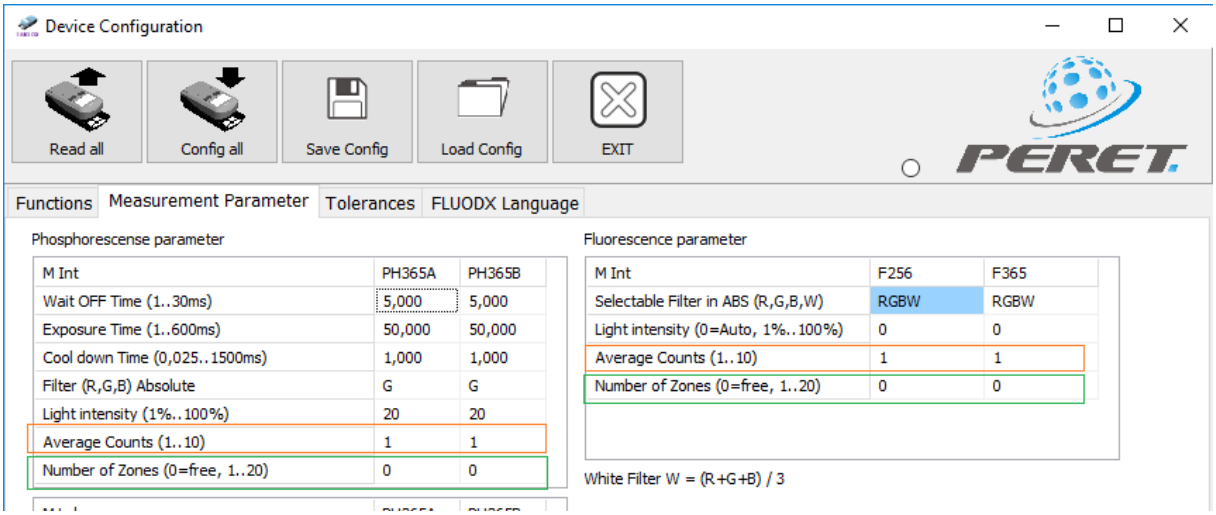
M Int Intensity measurement Mode

The MInt Intensity measurement Modes are used in the press room to collect production quality data in a simply, well defined manner.

The intensity measurements are organized by zones (Patches, Fields, Features). Up to 20 Zones can be collected and saved referenced by a Mark. The Mark is set automatically and can be used to identify the sheet, where the readings have been taken. Take a note of the Mark on the sheet.

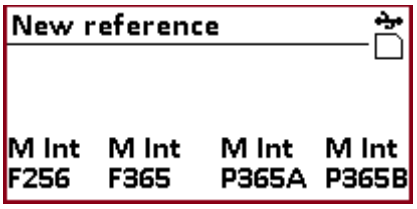
Inside any single Zone there can be taken up to 5 individual readings. Those readings are averaged automatically and the average numbers are saved permanently as the Zone value.

The FLUODX can be configured properly using the FLUODXConnect Software Device configuration function



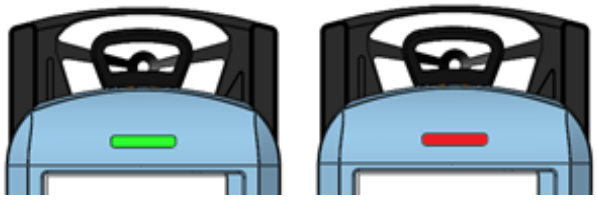
The number of Zones (green frame) can be fixed (configuration 1..20) or variable (configuration = 0). The Number of individual readings inside a zone can be 1 to 5 (red frame).

Measure References

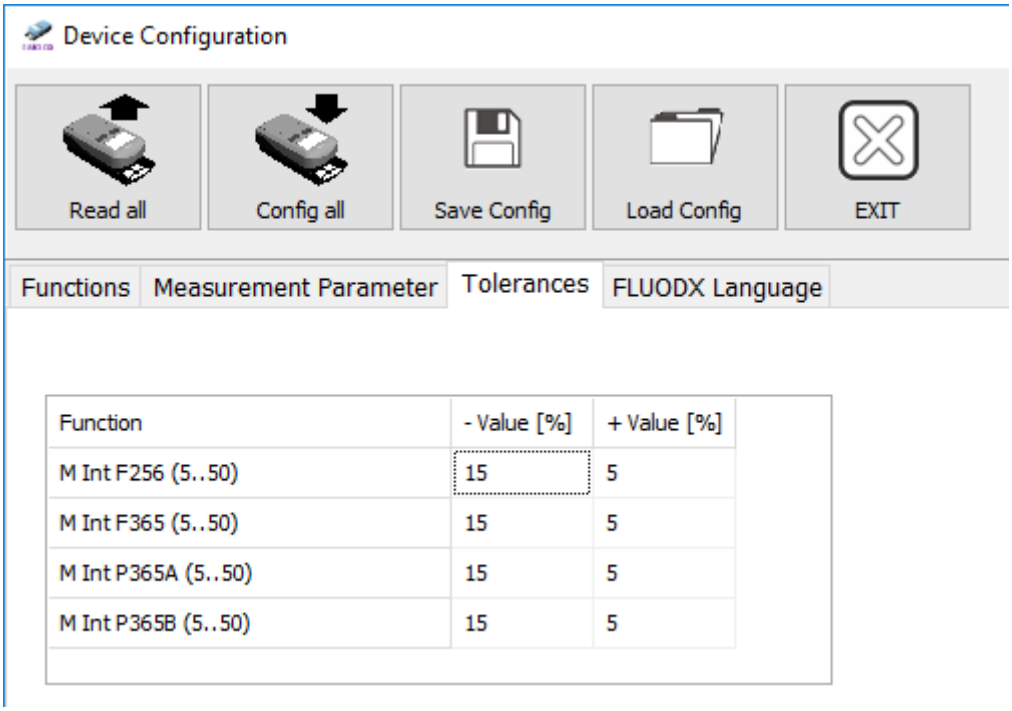


References for Fluorescence with 256nm or 365nm and two Phosphorescence reference sets with different timing settings can be measured.

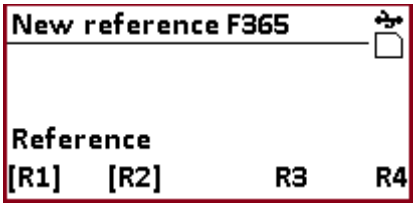
In relative measurement modes, the current measurement is compared to the reference in real time. If the difference is within tolerances, the status LED of the FLUODX will be flashing green. It will be flashing red if the difference is out of tolerance.



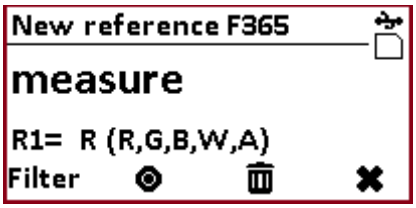
Tolerances can be configured using the FLUODXConnect Software



Fluorescence Intensity Reference (F256 or F365)



Up to 4 references can be stored in the device. If a reference is available, the proper number is displayed with brackets [ ]. Select the reference number you would like to measure.



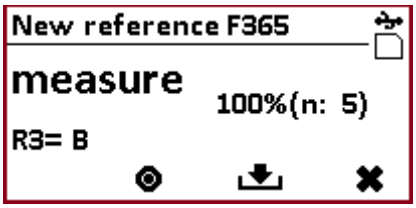
Key A: Select the Filter. You can choose one of the physical filters R, G or B. You can also select the black Filter W which is defined as W=(R+G+B)/3. Finally the A (Automatic filter selection) will automatically select the filter with the highest Signal response on the very first reference measurement.

Key B: Switch the positioning LED on.

Key C: Delete previously stored reference values.

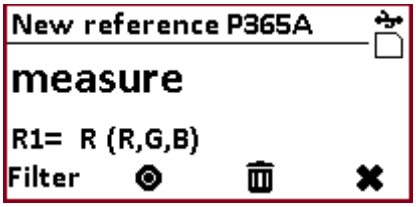
Key D: Exit

Measure the reference. Up to 20 measurements can be taken. The average will be calculated at the end.



Press Key C to save the Reference.

Phosphorescence Reference



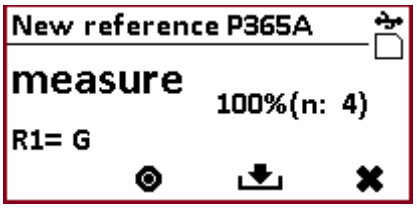
Key A: Select the Filter.

Key B: Switch the positioning LED on.

Key C: Delete the current values.

Key D: Exit

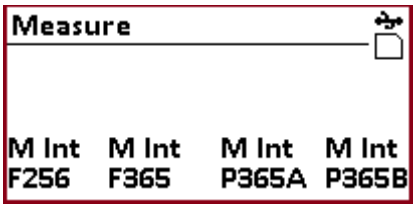
Measure the reference. Up to 10 measurements can be taken. The average will be calculated at the end.



Press Key C to save the reference.

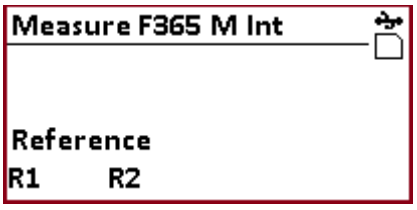
Measure relative Intensity

Press Key A on the start screen.

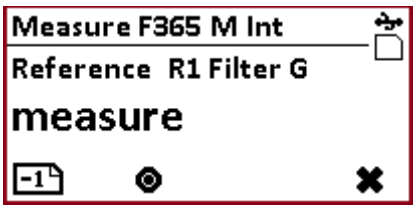


Measure Fluorescent Intensity

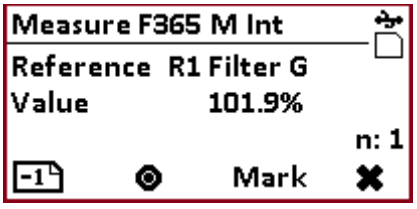
Press Key A or Key B to measure Fluorescent intensity against a reference.

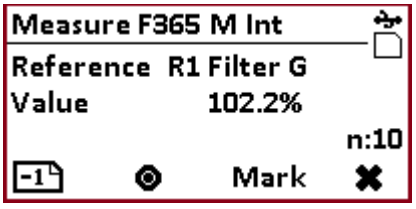


Select one of the references available by pressing the key below the reference number.



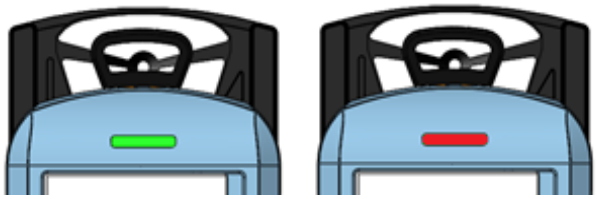
Measure up to 20 samples.





The pigmentation in relation to the reference is displayed. The screen on the left shows that 102.2% of the pigmentation has been achieved.

If the Value is in tolerance, the green status LED will be flashing for a short period of time. If it is out of tolerance, the red status LED will be flashing for a short period of time.



Key A: Delete the most recent reading.

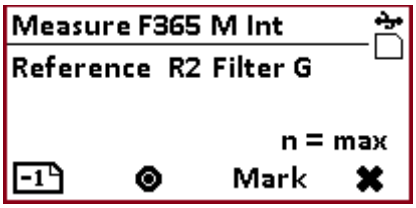
Key B: Positioning LED on

Key C: Terminate the measurement process and save data permanently using an Identification mark.

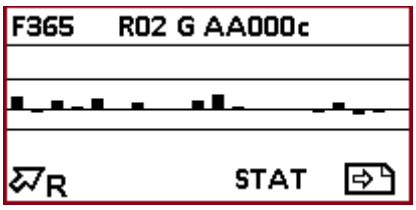
Key D: Exit

Hidden function: Press and hold Key A, click Key D, release Key A : go back to the <select Reference screen> without saving measurement data.

Once 20 measurements have been taken on the next measure attempt the device will display n=max. No more readings can be taken on the current sheet. Set a mark.



If you save the measurement data, the statistics will be displayed.

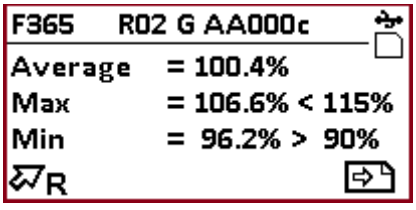


The current mark is displayed on the top line. Use this to Identify the sheet on which the measurements have been taken. Take a not of the Mark on the sheet.

Key A: Select next reference

Key C: Statistics

Key D: Start to measure next sheet



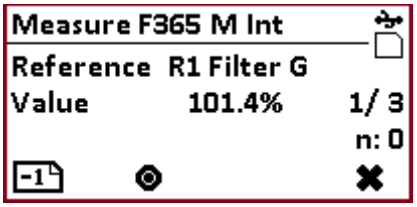
The Tolerance is configured using the Software FLUODXConnect.

Key A: Select next reference

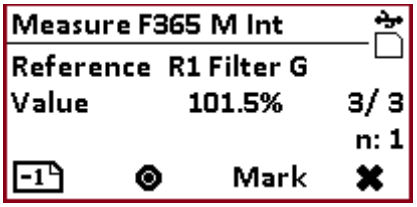
Key D: Start to measure next sheet

The FLUODX can be configured using the FLUODXConnect Software to ask for a set of readings within every single zone.

In this case the operator has to take that number of readings before measuring the next zone.

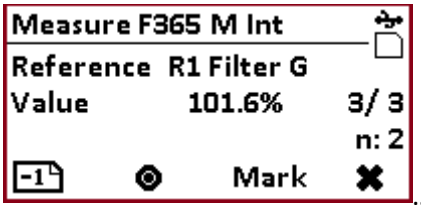


The operator in above example taken one reading out of three readings is has to take in the first zone.



Now the operator has taken three readings in the first zone and could create a Mark or proceed with the next zone. The average of the performed readings will be automatically saved as measurement value for that zone.

In order to proceed on the same sheet measuring the next zone, the operator simply continues to measure without pressing any key.



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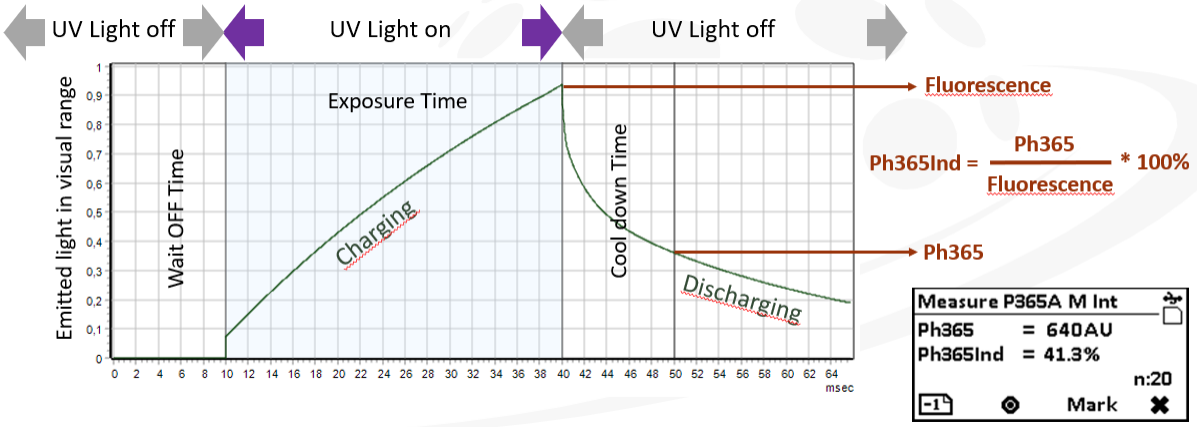
The second zone has been measured. The operator now can continue measuring the third zone.

Measure Phosphorescence Intensity

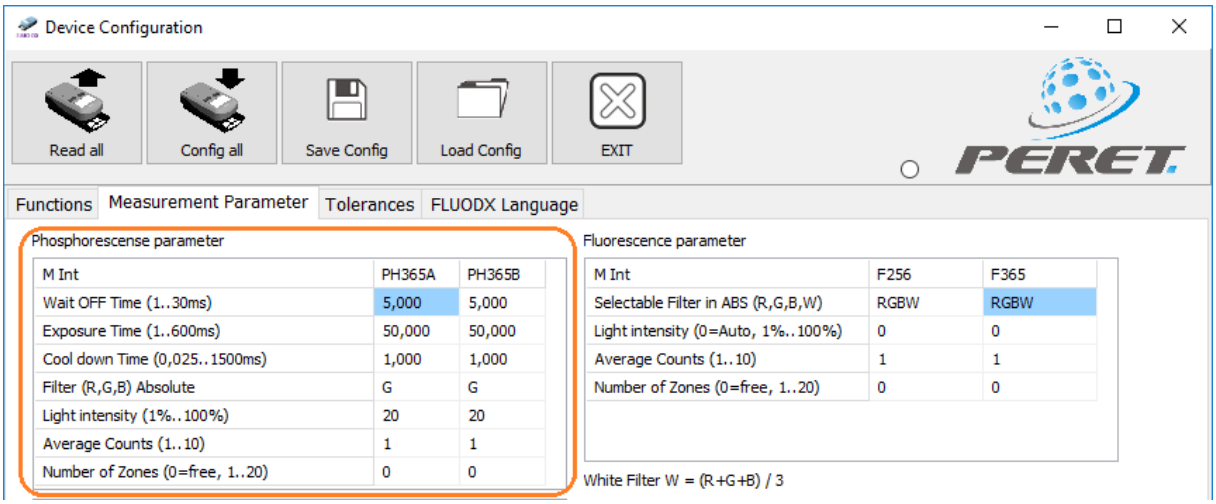
The Phosphorescence is measured based on three time frames:

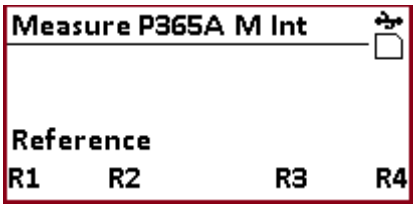
1. Wait OFF Time: Before switching on the UV light, the FLUO DX measures the base Fluorescence Intensity of the sample. If the sample is not phosphorescent, the Intensity will basically be the dark current. If the sample is phosphorescent and it has been exposed to UV light before the measurement process starts, there can be a residual Fluorescent Intensity that at needs to be taken into consideration.
2. Exposure Time: During the exposure time the sample is illuminated by a 365nm UV light of a pre-defined power. The sample is charging. At the end of the Exposure Time the Fluorescence is measured.

3. Cool Down Time: The UV light is switched off and the FLUO DX waits the Cool Down Time before measuring the Phosphorescence. If the measured signal is zero, no phosphorescence can be measured.

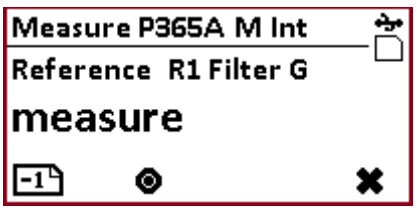


The time frames are configured using the FLUODXConnect Software.

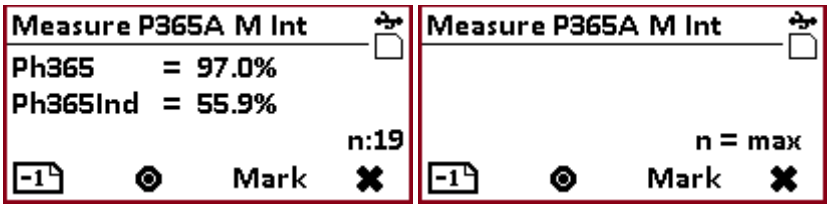




Select a reference by pressing the key below the reference number.

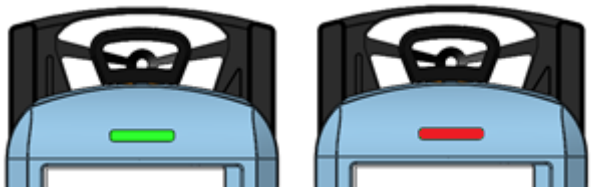


Measure a sample. There can be measured up to 20 zones on one single sheet. Once 20 readings have been taken, n=max will be displayed. No more readings can be taken without setting a Mark.



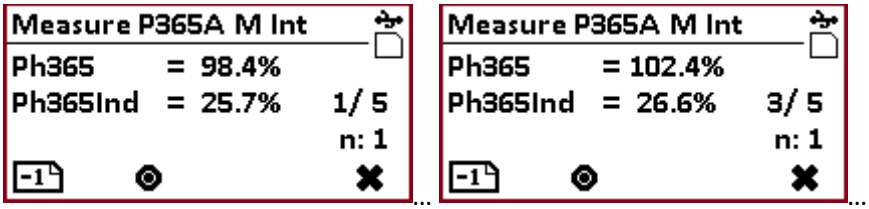
The PH365 Value is the Phosphorescence measured after the Cool Down Time in relation to the reference. The Ph365Ind is the ratio between Phosphorescence and Fluorescence.

If the PH365 Value is in tolerance, the green status LED will be flashing for a short period of time. If it is out of tolerance, the red status LED will be flashing for a short period of time.

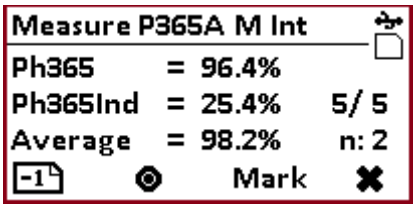


The FLUODXConfig Software can be used to configure a number of readings, that should be taken inside one zone to obtain an average value.

On the right hand it is displayed, that the first measurement out of 5 measurements to take has been taken (1/5). Continue to measure in the same area until 5 measurements have been taken.



The current measurement values are displayed. Once all 5 measurements have been taken, the average measurement of PH365 is displayed in the bottom line.



The average will be stored permanently in the device for future upload purpose. It is also displayed in the bar diagram.

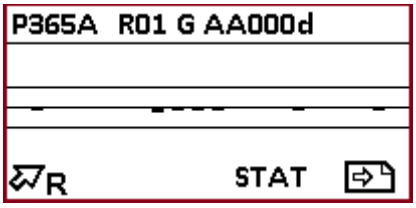
If the average counter is set to 1, no average will be displayed and the current reading is saved.

Key A: Delete the most recent reading. If the reading is one to calculate the average, the average measurement is restarted from its beginning. If no averaging measurement has yet been taken (0/5), the most recent sample measurement is deleted (n:1)

Key B: Positioning LED on

Key C: Terminate the measurement process and save data permanently using an Identification mark.

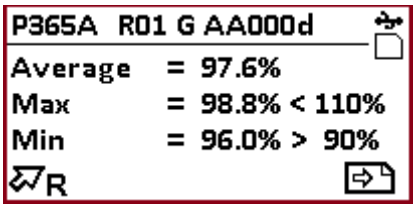
Key D: Exit to main menu



Key A: Select next reference

Key C: Display the statistics.

Key D: Next sheet

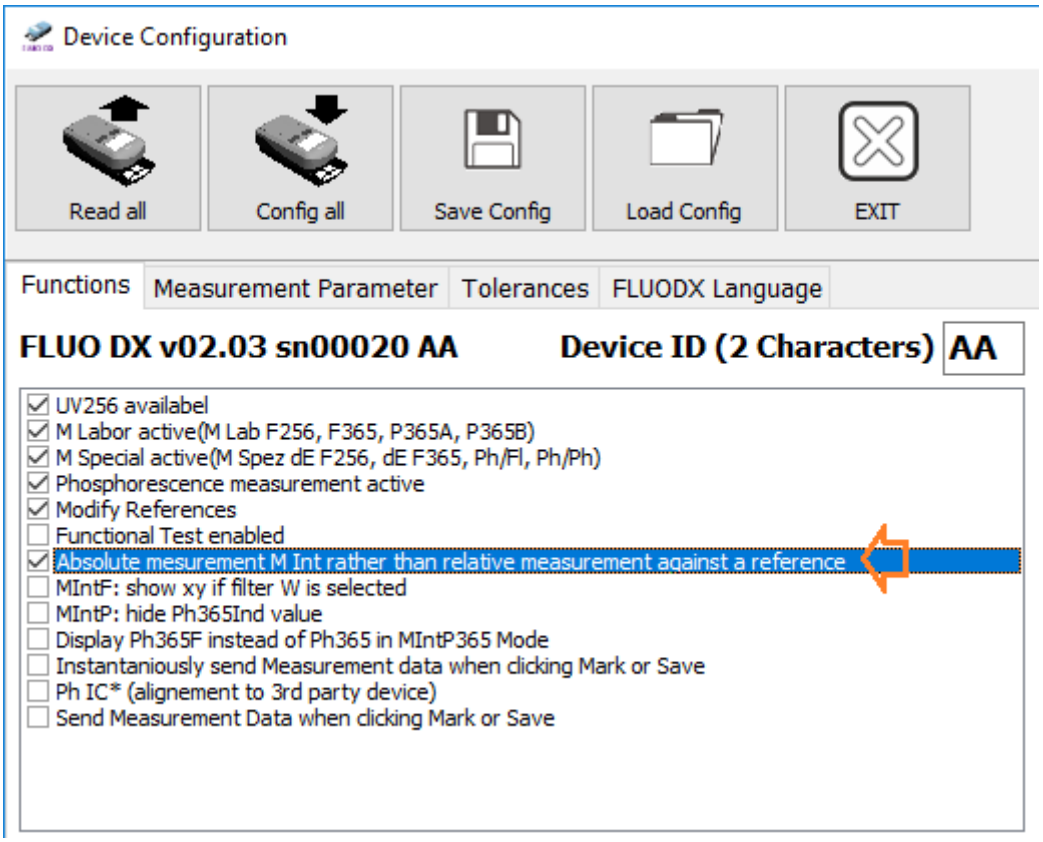


Key A: Select next reference

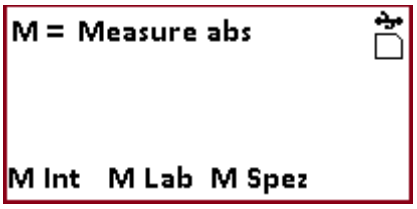
Key D: Next sheet

MInt Measure absolute Intensity

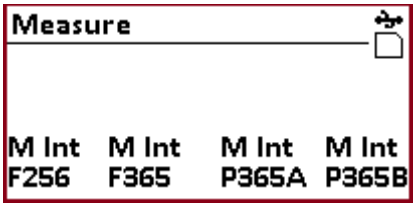
Use the PRESTOConnect Software to set the FLUODX to absolute measurement mode.



In ABS Mode there cannot be measured references.

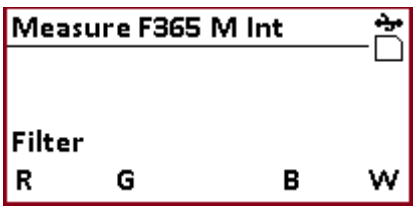


Click key A to select the measurement mode

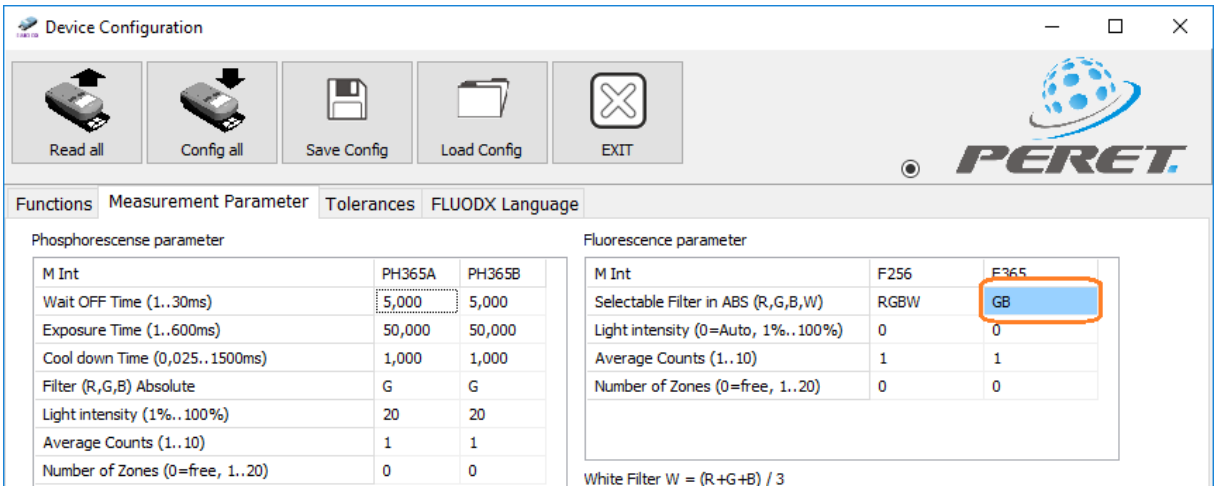


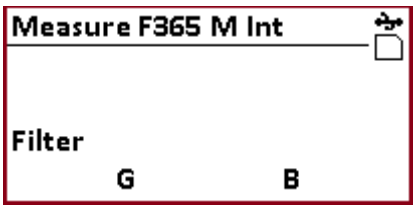
MInt Measure absolute Fluorescence Intensity

Click Key A to measure absolute Fluorescence Intensity using 256nm Illumination, click key B to measure absolute Fluorescence Intensity using 365nm Illumination.

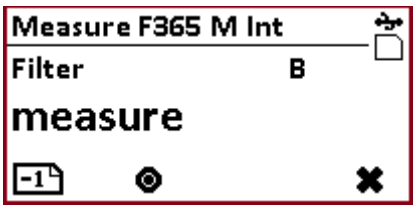


Use the FLUODXConnect Software to restrict the set of available filters.

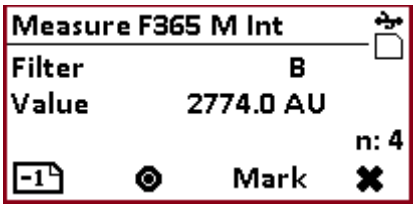




Select the Filter you would like to use to measure the absolute fluorescence Intensity by clicking key below the Filter character.



Measure samples. There can be measured up to 20 zones per sheet



Key A: Delete the most recent reading.

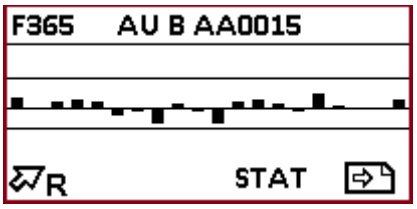
Key B: Positioning LED on

Key C: Terminate the measurement process and save data permanently using an Identification mark.

Key D: Exit

Hidden function: Press and hold Key A, click Key D, release Key A : go back to the <select Filter screen> without saving measurement data.

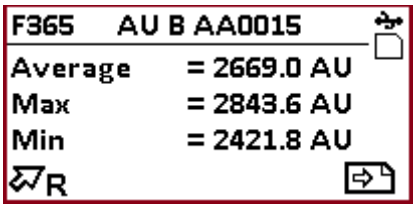
Click Mark to display the bar diagram



Key A: Select next Filter

Key C: Display the statistics.

Key D: Next sheet

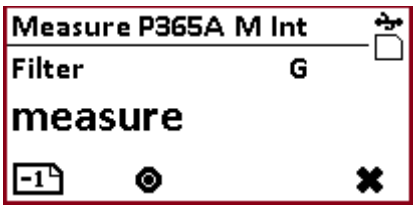


Key A: Select next Filter

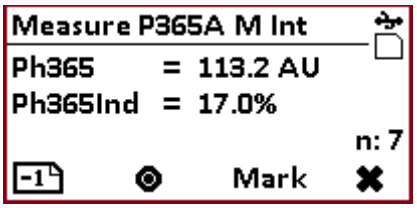
Key D: Next sheet

MInt Measure absolute Phosphore Intensity

Select P365A or P365B. The settings can be configured using the FLUODXConnect software.



Up to 20 individual zones can be measured on one single sheet before setting a Mark.



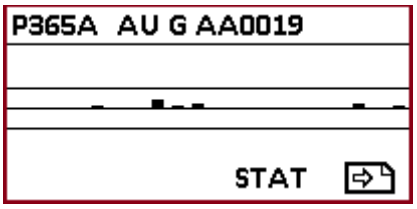
Key A: Delete the most recent reading.

Key B: Positioning LED on

Key C: Terminate the measurement process and save data permanently using an Identification mark.

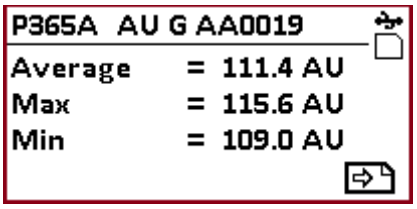
Key D: Exit

After pressing key B the bar diagram is displayed.



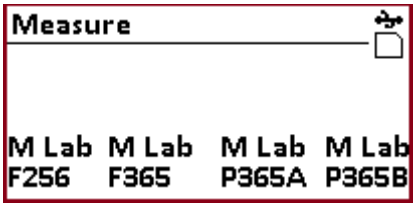
Key C: Display the statistics.

Key D: Next sheet



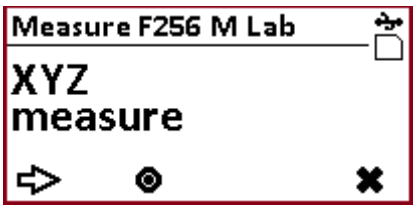
Key D: Next sheet

MLab Laboratory function

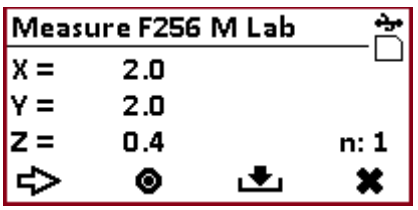


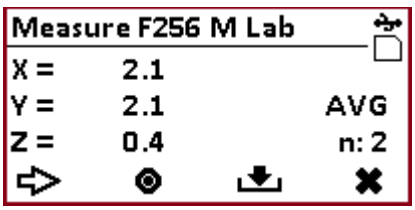
In this mode colorimetric analysis for fluorescent inks and phosphorescent analysis for phosphorescent inks can be made.

Fluorescent MLab function



Measure a sample. You can measure several times and take the average value.



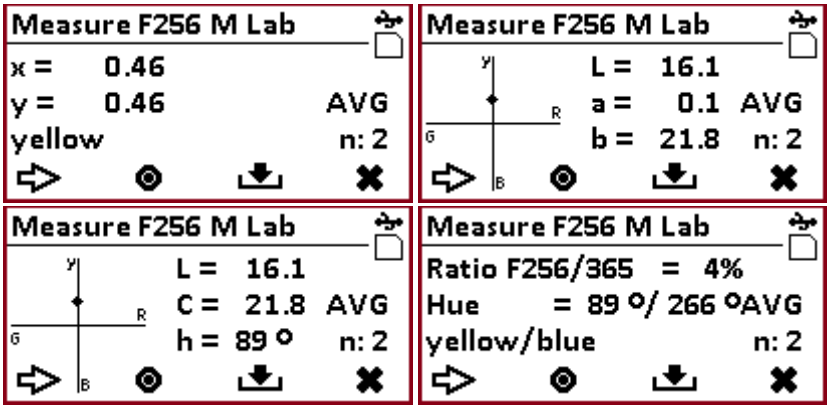


Key A: Next display

Key B: Positioning LED on

Key C: Save measurement

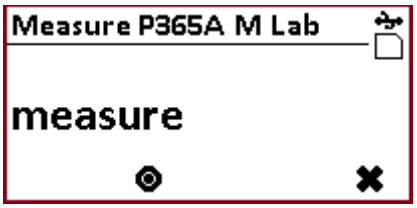
Key D: Exit



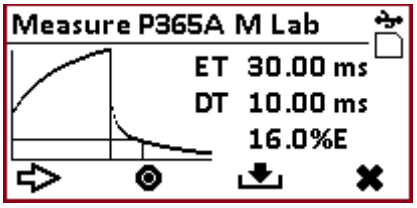
Bi-Fluorescent Analysis is available only in F256 Mode. Any measurement in F256 Mode is based on two readings, one with UV 256nm illumination and the second one with 365nm illumination. The Bi-Fluorescent Analysis screen shows the following values:

- Ratio F256/365 is the ratio between the Fluorescent signals measured. The above example shows that the 256nm Fluorescence is only 4% compared to 365nm Fluorescence.
- Hue: if the sample is exposed to 256nm UV light, the fluorescent color Hue is 89° (yellow) while when exposed to 365nm UV light, the fluorescent color Hue is 266° (blue).

M Lab Phosphorescence



Measure a sample.



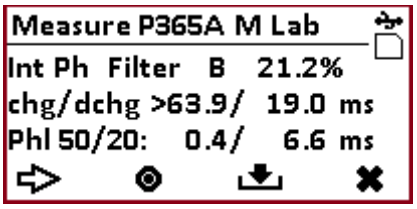
The graph shows the charging and discharging behavior of the sample. The ET (exposure time) is configured as 30ms, the DT (Cool down time) is 10ms. The exposure energy E is 16%.

Key A: Next display

Key B: Positioning LED on

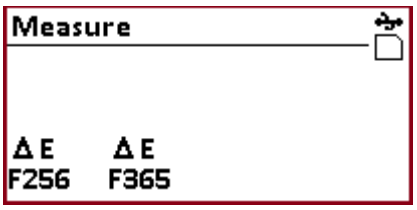
Key C: Save measurement

Key D: Exit

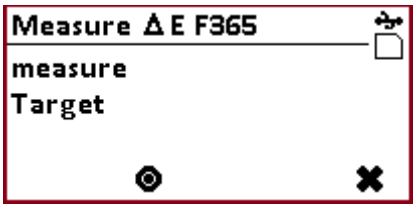


The sample has been measured using the B (blue) filter. The Phosphorescence (emitted light intensity) measured after the Cool down time is 21.2% of the Fluorescence, measured after the Exposure Time before switching the light source off. The charging time is estimated to be at least 63.9ms to reach saturation. The discharging time is estimated to be 19ms. After 0.4ms the Phosphorescence decays below 50% of the Fluorescence. After 6.6ms the Phosphorescence decays below 20%.

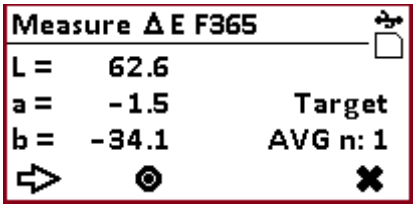
MSpez function



In this mode you can measure the delta E between two samples



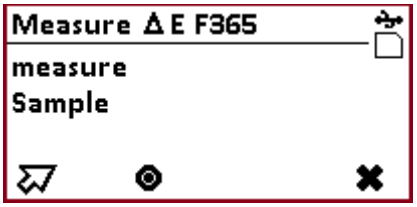
Measure the Target several times. The Average is taken as reference.



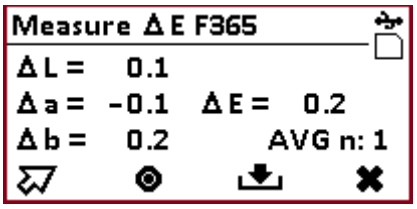
Key A: Switch to sample measurement

Key B: Positioning LED on

Key D: Exit



Measure the sample several times. The Average is calculated.



Key A: New reference

Key B: Positioning LED on

Key C: Save measurement

Key D: exit