Handy PEA Portable Fluorescence Measurement System

InfoSheet

Hansatech Instruments

- Compact (170 x 85 x 40mm), lightweight (565gms).
- Large-scale screening capacity up to 1000 full trace data files.
- High time resolution detection for discrimination of fast fluorescence induction kinetics.
- Saturating high intensity focused LED array for accurate determination of Fmax.
- Upload user-defined, repeatable experimental protocols for automatic field execution.
- Interchangeable sensor unit cables with lengths of up to 20 metres.
- Windows® data transfer & analysis software.

Handy PEA is a compact, highly portable continuous-excitation type chlorophyll fluorescence analyser. The rugged yet lightweight design makes Handy PEA particularly suitable for rapid, large scale screening of samples in the field or greenhouse in both research and teaching applications.

Handy PEA Control Unit

The Handy PEA control unit is a compact, light-weight case encapsulating sophisticated electronics providing the high time resolution essential in performing measurements of fast fluorescence induction kinetics. An initial sampling rate of 100 kHz is used in order to obtain an accurate measurement of the Fo parameter. Subsequent readings are performed at slower sampling rates. Handy PEA is powered by 3 rechargeable (Ni-MH) batteries providing a full days intensive measurement capability.

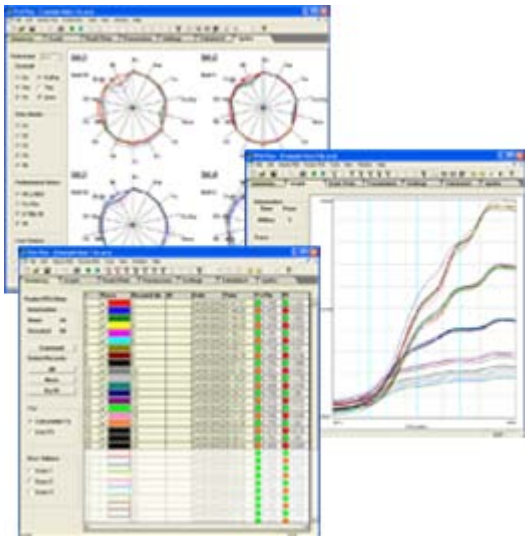
Simple to configure & operate, the Handy PEA features the capacity to store up to 5 user-defined protocols for different field applications. Protocols are written using a custom 32 bit Windows® software package (supplied). This allows single or multiple measurement assays with optional pre-illumination periods to be defined & uploaded to the memory of Handy PEA via RS232 serial communications. The use of protocols ensures maximum reproducibility of results during field applications involving large scale screening away from a laboratory environment.

Up to 1000 recordings of between 0.1 - 300 seconds may be saved in the memory of Handy PEA. Saved data may be viewed onscreen or transferred to the Handy PEA software where it may be viewed graphically or exported to external software packages for further statistical analysis.

Handy PEA Sensor Unit.

The sensor unit consists of an array of 3 focused ultra-bright red LED's optically filtered to a peak wavelength of 650 nm at a maximum intensity of >3000 µmol m^{-2} s^{-1} at the sample surface. Fluorescence emission from the sample is detected by a fast response PIN photodiode fitted with an RG9 long pass filter. The sensor unit is connected to the Handy PEA control unit via a standard connection cable of 1m in length however, connection cables of up to 10m in length are also available on request.

32 Bit Windows® Software.



Handy PEA is supplied with a comprehensive 32 bit Windows® data transfer & analysis software package providing a high degree of additional measurement flexibility. Transferred data is initially presented in a worksheet format with all calculated parameters displayed. Several data presentation & analysis tools are featured in the software including linear/logarithmic graphical representation of full trace data, rank & spider plots of key fluorescence parameters. Transferred data may also be exported to external specialist data presentation & analysis software packages.

Parameters Measured by Handy PEA.

Fo - fluorescence level when plastoquinone electron acceptor pool (Qa) is fully oxidised.
Fm - fluorescence level when Qa is transiently fully reduced.
Fv - variable fluorescence (Fm-Fo).
Fv/Fm - maximum quantum efficiency of photosystem II.
Tfm - time at which Fm occurs.
Area - area over the curve between Fo & Fm, relates to the pool size of PSII electron transport acceptors.
JIP Test - In addition to the standard parameters all fluorescence trace data may be downloaded to the PC software for further analysis using techniques such as OJIP analysis (Strasser 1992).

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