Force A

MULTIPLEX

UV-Visible portable fluorometer

Measuring the **chlorophyll** and **polyphenols** contents in leaves and fruits.

Non-destructive

GPS and data logger

Any plant leaves and fruits

Real time results

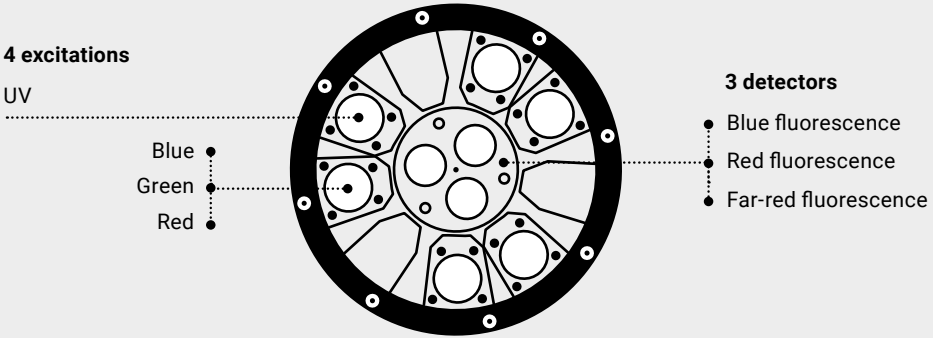
SENSOR

MULTIPLEX is a **portable fluorometer.** It is a multiparametric sensor able to measure **9 fluorescence signals**.

Based on these fluorescence signals, MULTIPLEX calculates plant physiological indices like **chlorophyll, flavonols, anthocyanins, blue fluorescing compounds**.

MULTIPLEX is widely used by plant scientists (physiology, agronomy, ecology, …).

Zoom on the sensor



FEATURES

Non-destructive measurement

Flashing with the MULTIPLEX doesn't cause **any damage** to the material measured.

Multi-parametrics sensors

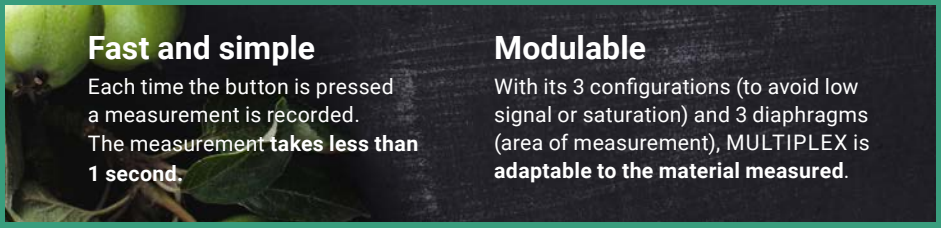
With its 4 excitation channels (blue, green, red and UV) and its 3 detection channels (blue, red and far red), the MULTIPLEX measures **9 individual signals** for a multiparametric analysis

Portable and autonomous

MULTIPLEX can be used **in the field, the greenhouse and the lab**. Its processor, its internal memory and its real-time display make it **totally autonomous** (no computer is required).

Designed for Plant Sciences

Fluorescence ratios (related to flavonol, anthocyanin, chlorophyll contents, etc.) are calculated and recorded along with individual signals, as well as other fluorescence indices linked to nitrogen nutrition (NBI®), fruit quality (FERARI®), disease detection (BGF_UV).



Fast and simple

Each time the button is pressed a measurement is recorded. The measurement **takes less than 1 second.**

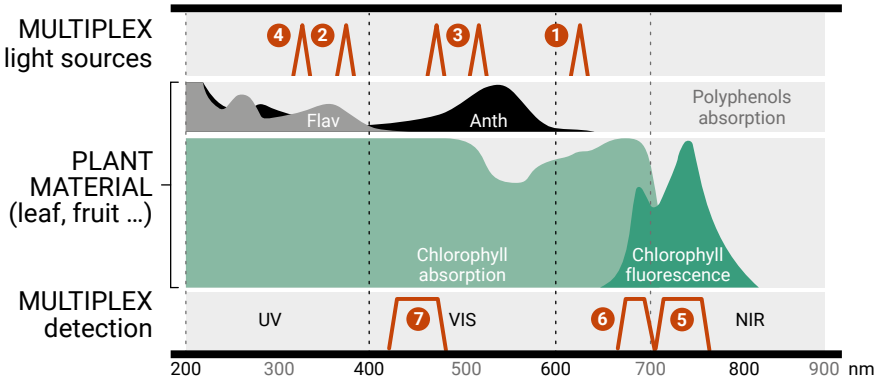
Modulable

With its 3 configurations (to avoid low signal or saturation) and 3 diaphragms (area of measurement), MULTIPLEX is **adaptable to the material measured**.

PRINCIPLES

Chlorophyll measurement

The chlorophyll content is the ratio of chlorophyll fluorescence measured in the far-red 5 to the chlorophyll fluorescence measured in the red 6. This measurement is based on the overlapping of the absorption spectrum and the fluorescence-emission spectrum of chlorophyll. This reabsorption occurs at shorter wavelengths (red) but not at longer (far-red) wavelengths.



Polyphenols measurement

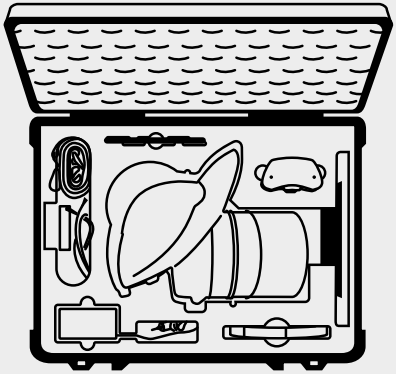
Far-red chlorophyll fluorescence 5 is measured under a first reference excitation light 1 not absorbed by polyphenols. It is compared to a second sampling light specific to a particular type of polyphenols (e.g. green 3 for anthocyanins or UV-A 2 for flavonols). Only a fraction of this light reaches the chlorophyll in the mesophyll and can generate far-red fluorescence.

Blue fluorescing compounds measurement

Thanks to a specific version of MULTIPLEX using a different UV LED excitation 4 , the device can detect blue fluorescing compound 7 such as phytoalexins. That can be really useful for biotic stress studies.

TECHNICAL SPECIFICATIONS

Measuring material	Any plant material
Principle of measurement	Fluorescence
Parameters measured	9 raw fluorescence signals, Chlorophyll (CHL), Flavonols (FLAV), anthocyanins (ANTH), phytoalexins (BGF_UV), NBI
Light excitation	UV-A (365 nm) or UV-B (340 nm), Blue (465 nm), Green (520 nm), Red (630 nm)
Fluorescence detectors	Blue (435 nm), Red (685 nm), Far-Red (740 nm)
Area measured	50, 28 or 12,5 cm²
Measurement time	< 1 s
User interface	3.2" graphic LCD panel with touchscreen, sound warning
Positioning	Internal GPS
Relative GPS accuracy	< 2,5 m (CEP, 50%, 24 h static)
Storage capacity	1 million of multiparametric data
Data output	.csv file
Data transfer	SD card
Operating temperature	From 5 to 45 °C
Battery	Li-ion rechargeable
Autonomy	8 hours
Charging time	3 hours
Total weight	2,5 kg
Size	340 x 280 x 170 mm



MULTIPLEX case contains:

- MULTIPLEX
- Battery and cable
- Charging unit and power supply cable
- SD card and USB-SD adaptator
- GPS antenna
- Diaphragms (4, 6, 8 cm)
- Blue reference standard
- Red reference standard (MX330)
- Strap.

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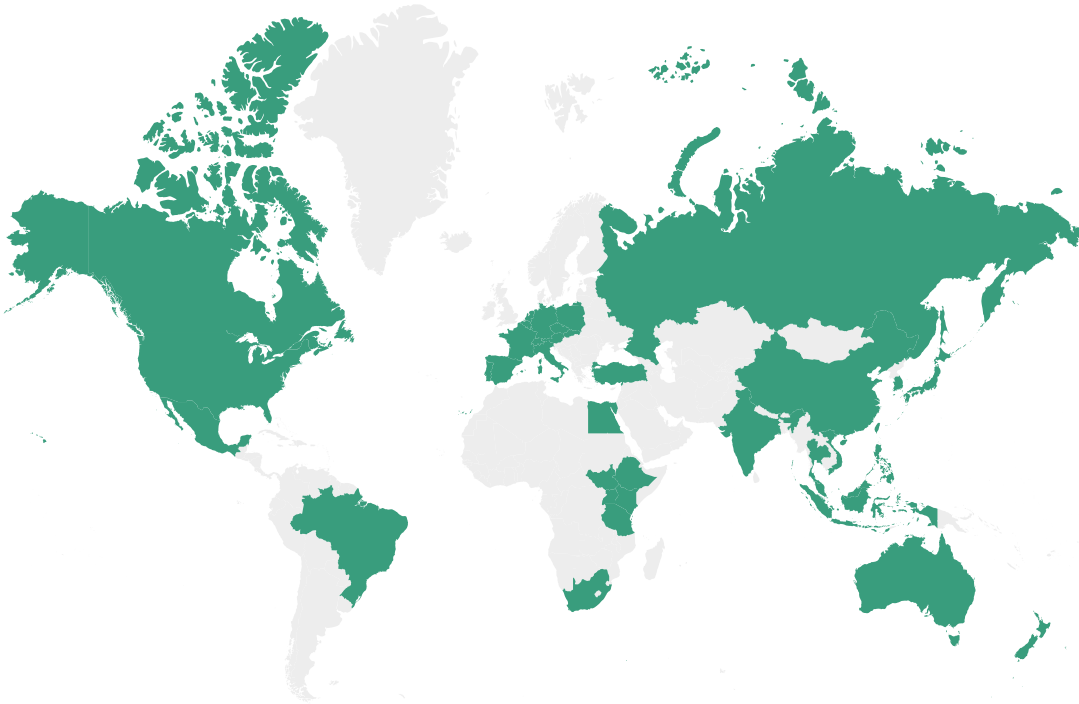

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