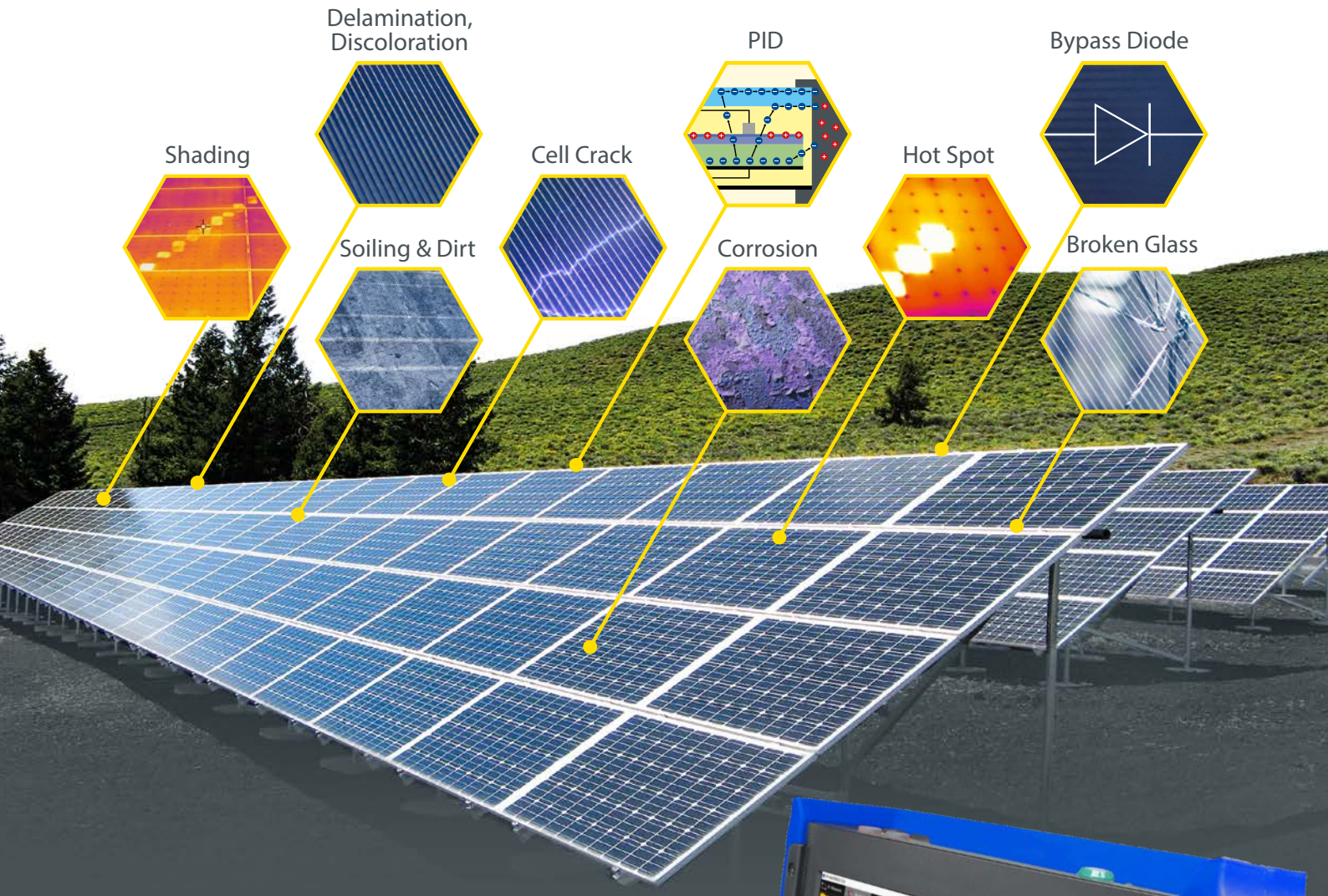
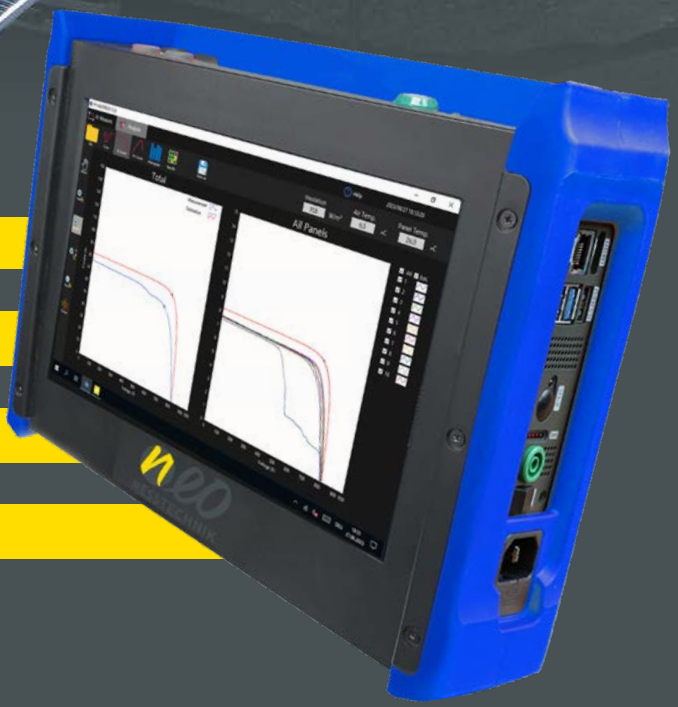
neo MESSTECHNIK

MULTI-CHANNEL IV CURVE TRACER

World's most versatile Solar Power Plant diagnostic system





POWER PERFORMANCE

IV-CURVE-TRACING

DISTANCE-TO-FAULT

LEAKAGE MEASUREMENT

How does the PV Master unleash your solar power potential?

Performance: Testing ensures that PV modules, and other components perform as expected under various conditions. The PV Master assesses their efficiency, power output, and reliability.

Safety Compliance: Early fault detection through a combination of leakage current measurement and IV curve tracing.

Inspection methods

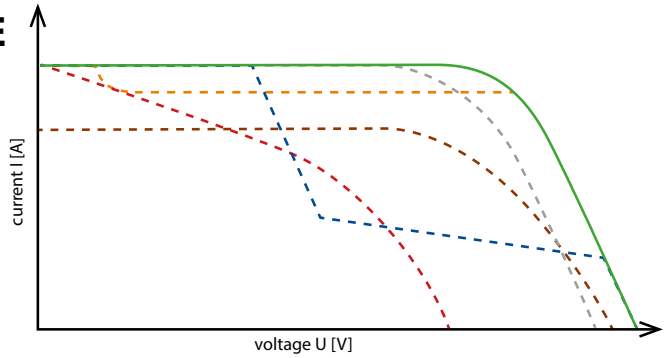
There are already a few methods to carry out PV inspections. The ones mainly used in the field are thermal imaging and electroluminescence but since they often need a lot of time and know how to use, they aren't flawless.

Diagnosis / Faults	Optical Inspection	Thermal Imaging	Electro-luminescence	1-Channel IV-Curve Tracing	Multichannel IV-Curve Tracing
PID	×	△	✓	✓	✓
Bypass open	×	×	×	✓	✓
Bypass shorted	×	✓	✓	✓	✓
Hot Spots	×	✓	△	✓	✓
Cell Crack	×	△	✓	△	△
Disconnection	×	✓	-	✓	✓
Snail Trail	✓	△	-	✓	✓
parallel Mismatch	×	×	×	×	✓
Needed Time	-	High	High	High	Low

× no detection △ partly detection ✓ full detection

World's only instrument to detect parallel Mismatch-Losses

Exemplary faults detected by IV – CURVE



Standard Test Conditions
Expected curve when no damage or aging is present.

Hotspots
When solar cells within a module no longer supply current due to partial shading they heat up strongly due to the current of the other cells connected in series. In the worst case, a hot spot can lead to fires, but in any case, it results in a power reduction.

PID – Potential Induced Degradation
PID occurs when a voltage difference prevails between panel and ground. The primary circuit thereby produces a partial voltage discharge which then results in an output power reduction.

LID - Light Induced Degradation
The degradation of photovoltaic modules describes the reduction in performance due to aging effects. This mainly includes browning, cell bleaching blistering or cell corrosion.

Bypass-Diode Breakage
Bypass-Diodes can break due to production faults, thunderstorms, overheating, mechanical damage or continuous shading. When that happens the system voltage will be reduced leading to output power reduction.

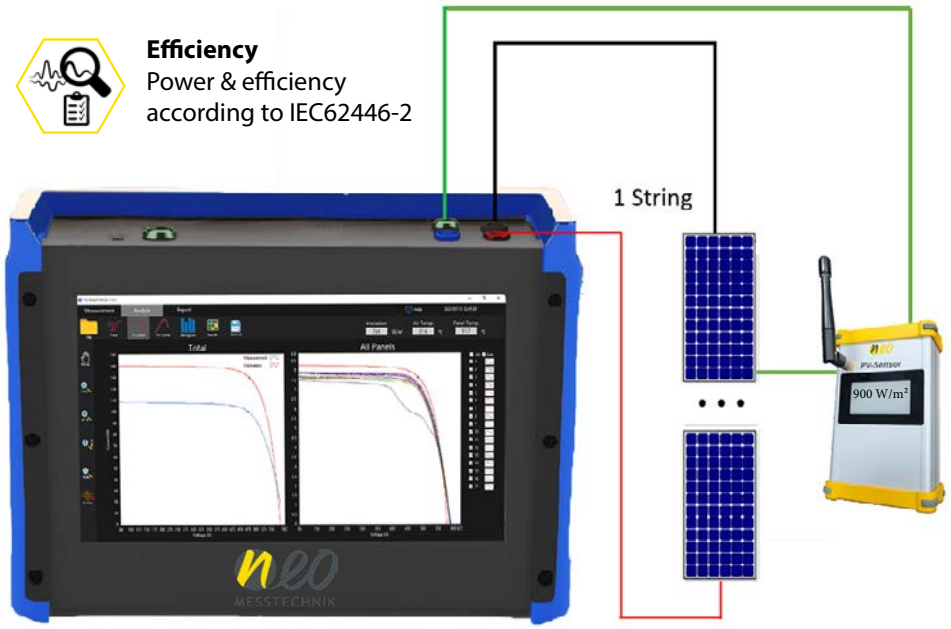
Shading
Shaded modules do not only reduce the power output but also lead to bigger problems like Hotspots or breakage of the bypass diode.

Why is it the world's most versatile Solar Power Plant diagnostic system?

- **Multimeter Mode (U, I, P)**
- **Mobile Operation up to 4 hours**
- **Easy Remote Connection (LAN, WLAN, UMTS)**
- **Direct Analysis on the Instrument using the 10.1 inch Multi-Touch-Screen**

The best IV-Curve Tracer

Efficiency
Power & efficiency according to IEC62446-2



Sensor Box Options:

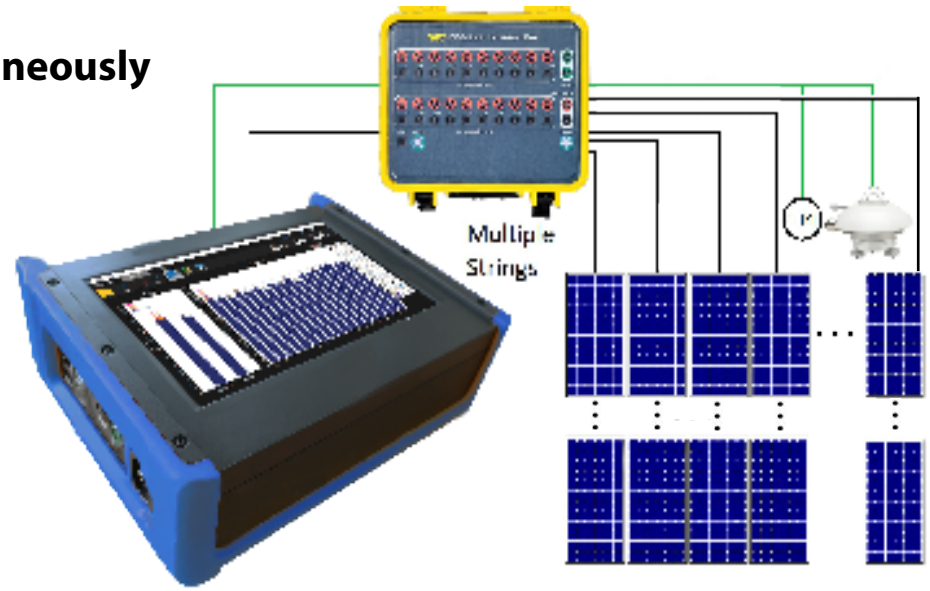
Sensor Box Lite
Integrated Class C Pyranometer, ambient and module temperature (PT100/PT1000)

Sensor Box Expert
- up to 2x Radiation (Pyra Class A, B or C)
- up to 5x Temperature (PT100/1000 or Thermocouple Typ K)
- wired or wireless (up to 100m)
- Touch-Screen Display and battery powered
- Bifacial Module support

Devices

Up to 20 strings simultaneously

The modular system of the PV Master series offers the best possible flexibility for the user. 1, 4, or 20 input channels can be connected to the device via an external switchbox.



PM-10: 1 Channel
Extension Box:
Option 1: 4 Channels
Option 2: 20 Channels

PV MASTER 10

1 Channel IV-curve tracing
Highly precise measurement diagnostics an report tool for PV systems.

up to 1500 V / 30 A
Designed for high-power applications (high voltage / high current)

20 CHANNEL EXTENSIONBOX

AUTOMATIC SWITCHING
Switches automatically through all connected Channels.
20x IV-curve measurement
20x Leakage measurement

PV MASTER 70

20 Channels with 1000 V / 30 A

PV MASTER 80

24 Channels with 1000 V / 30 A

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