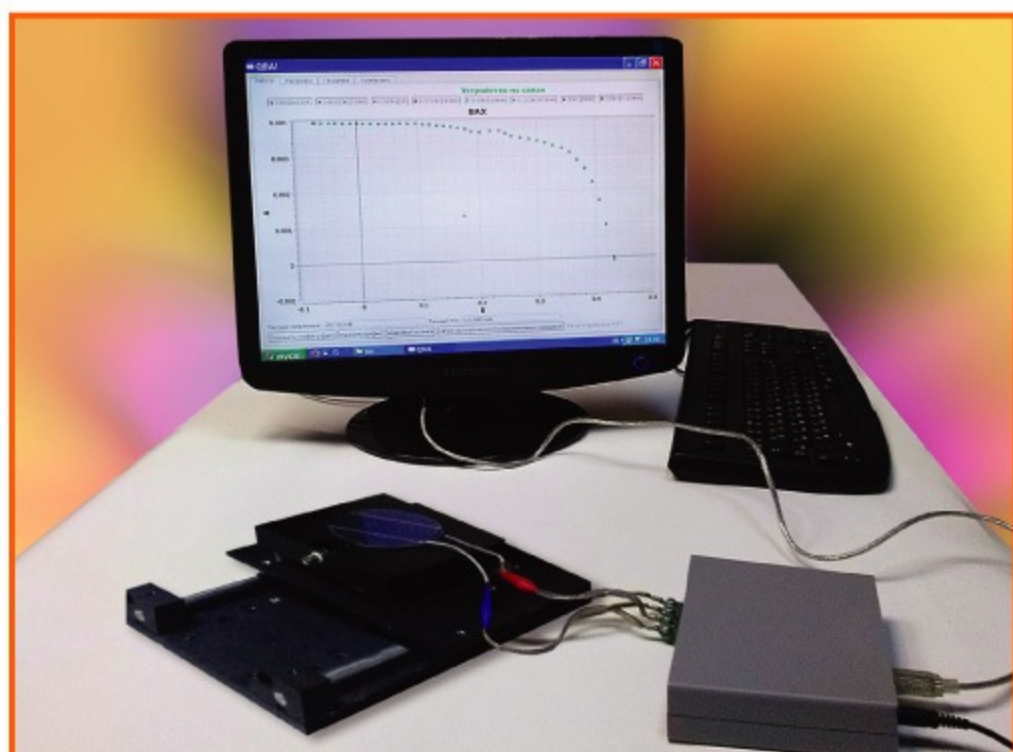# Automated device to measure current-voltage characteristics of solar cells and calculation of their parameters


The device is designed for incremental measurement of the current through a photovoltaic cell (PVC) and voltage with automatic changing of load parameters. To improve the accuracy of measurements, the PVC is connected to the load via the current channel. The PVC voltage is measured by means of an independent circuit.

Calculation of PVC parameters is performed by modeling of the measured current-voltage characteristics (CVC) by standard five-parametric CVC dependence with subsequent calculation of the parameter values of the optimized curve.

Intuitive interfaces (the window on the PC screen with a set range of key parameters) and low supply voltage allow to use the device in the educational process.

Parameters of CVC measurements

- Measuring voltage range, mV ——————————— from minus 100 to plus 800
- Measuring current range, A ——————————————————— 0 – 3
- The number of measurement current-voltage points (adjustable), pcsup ———————— to 300
- The number of current and voltage measurements at each point ——————————— 16
- The supply voltage, V ————————————————————— 12
- The accuracy of the current-voltage values measurement ————————— not less 1%
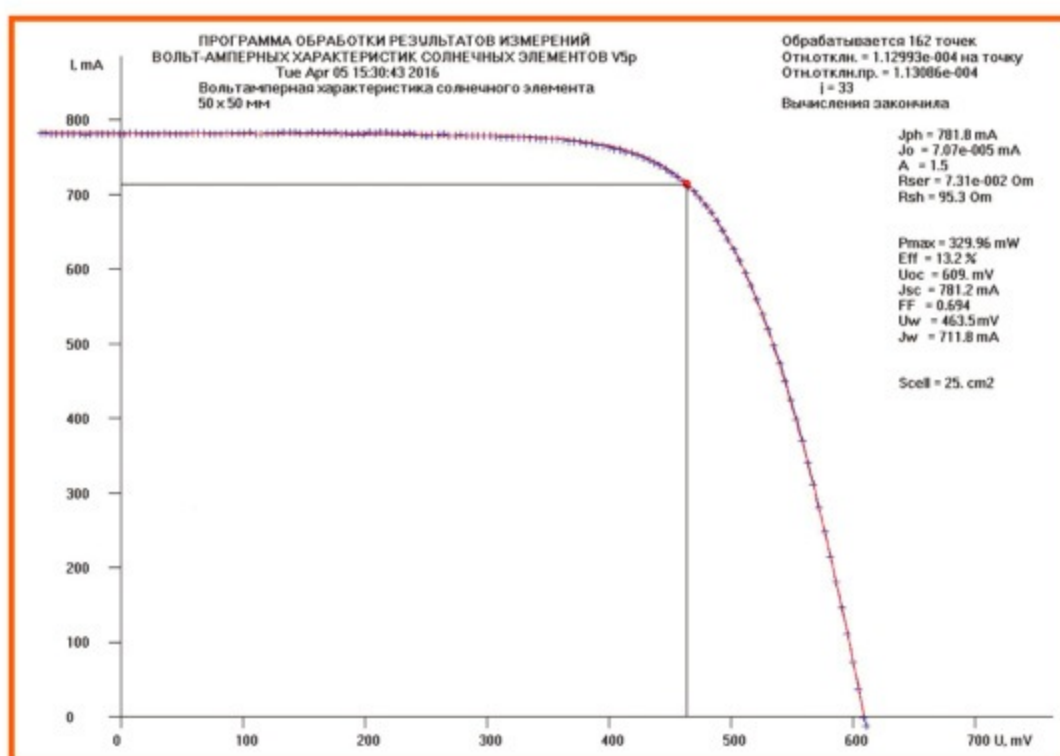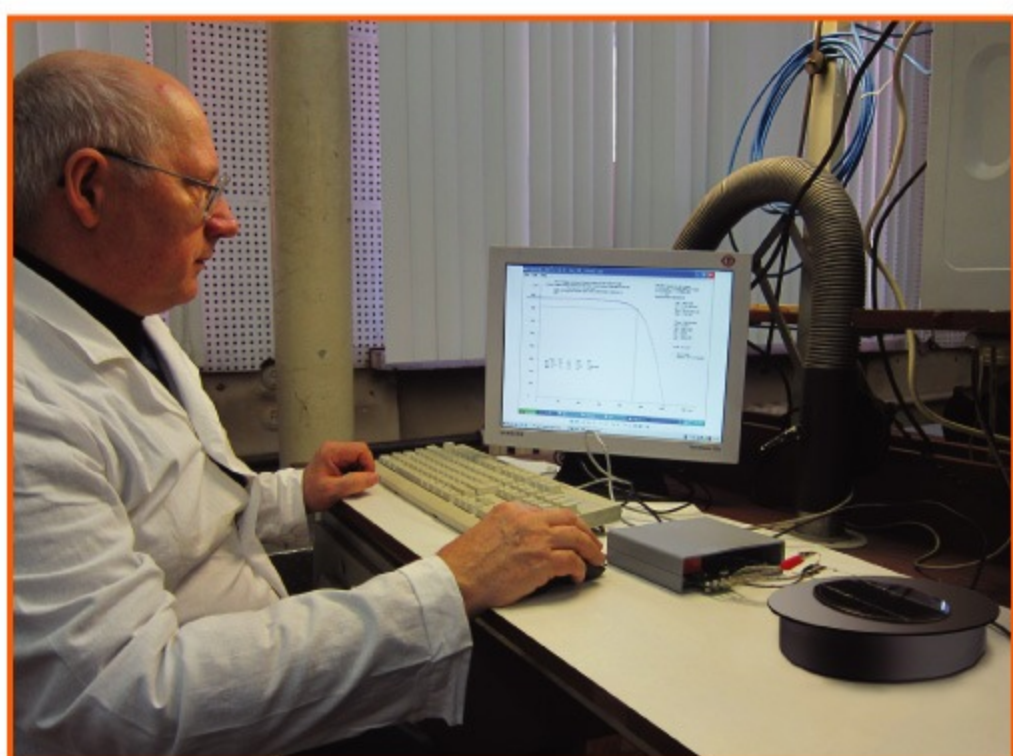
Set of delivery

- Measuring electronic unit
- The software to measure I-V curve
- The software for PVC parameters calculation
- Manual

The supplied software is installed by the Customer on a PC with pre-installed operation system not lower than Windows XP

Calculated PVC parameters

- Open circuit voltage ——————————— Voc
- Short circuit current ——————————— Jsc
- CVC fill factor ——————————————— FF
- Maximum power ——————————— Pmax
- Efficiency ————————————————— η
- Photocurrent, ——————————————— Jph
- Saturation current (reversebiese) —————— J0
- Quality parameter of the p-n junction ————— A
- Shunt resistance ———————————— Rsh
- Series resistance ————————————— Rs