



PV:1525 Series

Handheld 1500 V 25 A
PV Test Instruments



The PV:1525 Series instruments are designed for installers and O&M engineers to carry out electrical safety testing and performance measurements on PV systems up to 1500 V_{DC} and 25 A_{DC}, making them ideal for residential and commercial installations.

The PV:1525 Series performs ground continuity, insulation resistance, open-circuit voltage and short-circuit current tests, with the PV:1525-IV model also offering integrated IV curve tracing functionality.

With a new, innovative user interface,

the PV:1525 series continues Seaward's tradition of intuitive, easy-to-use test equipment while introducing features designed for modern installation testing. Results can be tagged with installation-specific information, making data management simple and efficient.

With Bluetooth® capabilities, test results can easily be transferred to a mobile app, PV:Sync Mobile (available for iOS and Android™), for review and exported for further analysis with SolarCert software. Over-the-Air updates via the app ensure your instrument is always up to date with the latest features.

Key Measurement Features:

- PV string open circuit voltage measurement up to 1500 V_{DC}
- PV string short-circuit current up to 25 A_{DC}
- Insulation resistance voltage up to 1500 V_{DC}
- 200 mA continuity measurement
- Graphical IV curve displayed on screen (PV:1525-IV only)
- Calculation of maximum power point voltage, maximum power point current, and fill factor (PV:1525-IV only)

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New PV:Sync Mobile app

Transfer test results directly from the PV:1525 Series to your mobile device. Reduce manual data entry, organise results on site, and generate professional reports quickly and accurately.

SolarCert software

Download, analyse and report PV test data with ease. SolarCert converts results into clear, professional reports, with I-V curve comparison and STC analysis, supporting accurate performance verification and streamlined certification workflows.

Application Guidance:

- Residential and commercial systems: Perfect for systems up to 1000 V
- Utility-scale systems: 1500 V capable
- Note: In higher current systems with higher irradiance values protection circuitry might be triggered due to effects of in-rush currents

Key Features and Comparison:

| Feature | PV:1525 | PV:1525-IV |
|---|---------|------------|
| Intuitive menu navigation and color display | ✓ | ✓ |
| Illuminated function buttons for guided navigation and testing | ✓ | ✓ |
| Auto test sequences – Efficient standard-compliant electrical safety testing according to DIN EN 62446-1 / VDE 0126-23-1 with 3 preprogrammed sequences | ✓ | ✓ |
| Auto test sequences – Customizable sequences for individual comfort testing | ✓ | ✓ |
| Manual mode for diagnostic testing | ✓ | ✓ |
| Open-circuit voltage and voltage measurement | ✓ | ✓ |
| Short-circuit current measurement | ✓ | ✓ |
| String test | ✓ | ✓ |
| Earth continuity / resistance measurement | ✓ | ✓ |
| Insulation resistance measurement | ✓ | ✓ |
| Operating power (with PV:1500 Clamp) | ✓ | ✓ |
| Graphical IV curve trace with display directly on screen | x | ✓ |
| Calculation of maximum power point voltage, maximum power point current, and fill factor | x | ✓ |
| Standard test condition (STC) comparison according to DIN EN IEC 60904-9 / VDE 0126-4-9 * (via PV:Sync Mobile app and SolarCert software) | ✓ | ✓ |
| Internal memory with structured measurement data storage (object > inverter > string) | ✓ | ✓ |
| Bluetooth® data transfer to PV:Sync Mobile app | ✓ | ✓ |
| Report generation and management via PV:Sync Mobile app and SolarCert software | ✓ | ✓ |
| Wireless updates – firmware changes can be applied via the PV:Sync Mobile app | ✓ | ✓ |

* For accurate comparison, irradiance and temperature data via the SS:200LR Wireless Irradiance Meter are required.

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Technical Specification:

Open-Circuit Voltage and Voltage Measurement (PV Terminals)

| | |
|-----------------|--|
| Display range | +10.0 V _{DC} ... +1500 V _{DC} / -10.0 V _{DC} ... -440 V _{DC} 10.0 V _{AC} ... 440 V _{AC} |
| Measuring range | +10.0 V _{DC} ... +1500 V _{DC} / -10.0 V _{DC} ... -440 V _{DC} 10.0 V _{AC} ... 440 V _{AC} |
| Resolution | 0.1 V _{DC} maximum |
| Accuracy | for +DC: ± (0.5 % + 2 digits) for -DC and AC: ± (5 % + 2 digits) |

Short-Circuit Current Measurement (PV Terminals)

| | |
|-----------------|--|
| Display range | 0.00 A _{DC} ... 25.00 A _{DC} |
| Measuring range | 0.50 A _{DC} ... 25.00 A _{DC} |
| Maximum power | 37.5 kW |
| Resolution | 0.01 A _{DC} maximum |
| Accuracy | ± (1 % + 2 digits) |

Maximum Power – String Test

| | |
|----------------------------------|--|
| String test maximum power rating | 37.5 kW* at panel efficiency ≤ 19 % 25 kW* at panel efficiency > 19 % |
| Voltage | up to 1500 V _{DC} |
| Current | up to 25 A _{DC} |

IV Curve (PV:1525-IV only)

| | |
|-------------------------------|--|
| Minimum number of test points | 20 |
| IV curve maximum power rating | 37.5 kW* at panel efficiency ≤ 19 % 20 kW* at panel efficiency > 19 % |
| Voltage | up to 1500 V _{DC} |
| Current | up to 25 A _{DC} |

Earth Continuity / Resistance Measurement

| | |
|---------------------------------|---|
| Test voltage open-circuit | > 4 V _{DC} , nominal |
| Test current into 2 Ω | > 200 mA |
| Display range | 0.00 Ω ... 199 Ω |
| Measuring range (IEC 61557-4) | 0.05 Ω ... 199 Ω |
| Resolution | 0.01 Ω maximum |
| Accuracy | 0.05 Ω ... 0.09 Ω ± (2 % + 1 digit) 0.10 Ω ... 0.19 Ω ± (2 % + 2 digits) 0.20 Ω ... 1.99 Ω ± (2 % + 3 digits) 2.0 Ω ... 4.9 Ω ± (2 % + 2 digits) 5.0 Ω ... 199 Ω ± (2 % + 5 digits) |
| Test leads zero | Zero up to 10 Ω |
| Visible warning | ≥ 30 V _{AC} or V _{DC} at inputs |
| Circuitry protection | Test inhibited if ≥ 30 V _{AC} or V _{DC} at inputs |
| Repeat tests as per IEC 61557-4 | Approx. 4000 1-second tests |

* Power limit is dynamically adjusted to compensate for in-rush currents due to various factors including (but not limited to) module efficiency, parasitic effects caused by the installation, and environmental factors such as irradiance.

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Technical Specification (Continued):

Insulation Resistance Measurement

| | |
|---------------------------------|---|
| Test voltage open-circuit | 250 V, 500 V, 1000 V, 1500 V (as per IEC 61557-2) |
| Test voltage specification | -0 % +20 % (open-circuit) |
| Test current short-circuit | < 2 mA |
| Test voltage at 1 mA | > 1 mA into $U_n \times (1000 \Omega/V)$ (as per IEC 61557-2) |
| Display range | 0.05 M Ω ... 999 M Ω |
| Measuring range (IEC 61557-2) | 250 V / 500 V string mode: 0.05 M Ω ... 200 M Ω 1 kV / 1.5 kV string mode: 0.05 M Ω ... 999 M Ω 250 V point to point: 0.05 M Ω ... 300 M Ω 500 V point to point: 0.05 M Ω ... 500 M Ω 1 kV / 1.5 kV point to point: 0.05 M Ω ... 999 M Ω |
| Resistance resolution | 0.01 M Ω for 0.05 M Ω ... 1.99 M Ω 0.1 M Ω for 2.0 M Ω ... 19.9 M Ω 1 M Ω for 20 M Ω ... 999 M Ω |
| Resistance accuracy | $\pm(5 \% + 1 \text{ digit})$ for 0.05 M Ω ... 0.19 M Ω $\pm(5 \% + 3 \text{ digit})$ for 0.20 M Ω ... 1.99 M Ω $\pm(5 \% + 2 \text{ digit})$ for 2.0 M Ω ... 5.0 M Ω $\pm(5 \% + 5 \text{ digit})$ for 5.1 M Ω ... 99 M Ω $\pm(10 \% + 5 \text{ digit})$ for > 99 M Ω |
| Insulation voltage resolution | 1 V |
| Insulation voltage accuracy | $\pm(2 \% + 2 \text{ counts})$ |
| Maximum system capacitance | 2 μF |
| Visible warning | $\geq 30 V_{AC}$ or V_{DC} at inputs |
| Repeat tests as per IEC 61557-2 | Approx. 4000 1-second tests |

Operating Current (Wireless via PV:1500 Clamp)

| | |
|-------------------------|---|
| Display range | 0.1 A _{DC} ... 400.0 A _{DC} |
| Current measuring range | 0.1 A _{DC} ... 400.0 A _{DC} |
| Resolution | 0.1 A |
| Accuracy | $\pm (5 \% + 2 \text{ digits})$ |

Operating Power (PV Terminals & Wireless via PV:1500 Clamp)

| | |
|-----------------|---------------------------------|
| Display range | 0.00 kW ... 600 kW |
| Measuring range | 0.50 kW ... 600 kW |
| Resolution | 0.01 kW |
| Accuracy | $\pm (6 \% + 2 \text{ digits})$ |

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General Specification:

Mechanical Design

| | |
|--------------------|---|
| Weight | Approx. 1 kg / 2.2 lb |
| Dimensions | 265 mm × 115 mm × 78 mm 10.4" × 4.6" × 3.1" |
| Display type | 3.5" color display with backlight |
| Display resolution | 480 × 320 pixels |
| Display FOV | 70° left to right 60° top to bottom |
| Power source | 11.55 V 2930 mAH lithium ion battery (rechargeable) |
| Auto power down | User-configurable |
| Onboard memory | 1000 slots |

Environmental Conditions

| | |
|-----------------------|--|
| Environment | Dry, without moisture condensation Indoor or outdoor use |
| Operating temperature | +5 °C ... +40 °C / +41 °F ... +104 °F |
| Barometric elevation | Max. 2000 m / 6562 ft. |
| Storage | -25 °C ... +65 °C / -13 °F ... +149 °F; dry, without moisture condensation; without battery pack |

Electrical Safety

| | |
|----------------------|--|
| Overvoltage category | IEC 61010-01 CAT III / 1500 V |
| Pollution degree | 2 (as per IEC 61010-1) |
| Protective system | Housing: IP40 as per IEC 60529 (Protection against ingress of solid foreign objects: = 1.0 mm / 0.039" Ø; protection against ingress of water: not protected) |
| Protection category | II |

Electromagnetic Compatibility (EMC)

| | |
|-----------------------|----------------------|
| Interference emission | IEC 61326-1, class A |
| Interference immunity | IEC 61326-1 |

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Data Interfaces:

Bluetooth® LE

| | |
|--------------------------------------|--|
| Frequency band | 2402 MHz ... 2480 MHz |
| Transmit power range | 20 dBm |
| Modulation type | GFSK |
| Channel spacing | 2 MHz |
| Radio spectrum efficiency (Art. 3.2) | STSI EN 300 328 V2.2.2 |
| Antenna type and gain | PCB antenna, 3.26 dBi |
| Usage | Transfer of test data; connection to peripherals, software updates |

Long-Range RF

| | |
|--------------------------------------|---|
| Frequency band | 433.375 MHz ... 434.625 MHz |
| Transmit power range | 4.89 dBm ERP |
| Modulation type | CSS |
| Channel spacing | 250 kHz |
| Radio spectrum efficiency (Art. 3.2) | ETSI EN 300 220-2 V3.2.1 |
| Antenna type and gain | FPC antenna, 2.8 dBi peak gain |
| Usage | Connect to SS:200LR Wireless Irradiance Meter |

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Scope of Delivery:

PV:1525 and PV:1525-IV

All instruments of the PV:1525 series are available as instrument with basic accessories only or as conveniently assembled kits which include connectible devices for additional measurements and an extended range of accessories.

| | Instrument Only | Complete Kit |
|---|-----------------|--------------|
| Instrument (PV:1525 or PV:1525-IV) | ✓ | ✓ |
| 4mm test probes with Alligator Clips | ✓ | ✓ |
| Instrument to MC4 Test Leads | ✓ | ✓ |
| Rechargeable battery pack | ✓ | ✓ |
| Battery charging cradle | ✓ | ✓ |
| PV:1500 Clamp** | x | ✓ |
| SS:200LR Wireless Irradiance Meter** | x | ✓ |
| Solar Survey – Quick release panel mounting bracket | x | ✓ |
| Carry Case | ✓ | ✓ |
| Quick Start Guide | ✓ | ✓ |
| Declaration of conformity | ✓ | ✓ |
| Calibration certificate | ✓ | ✓ |
| SolarCert software license (1 x) | ✓ | ✓ |

** Please see below for full scope of delivery of these devices.

SS:200LR Wireless Irradiance Meter

- 1 x SS:200LR Wireless Irradiance Meter
- 1 x Solar Survey Quick Fix Dual Temp Probe
- 2 x AA batteries
- 1 x USB download cable
- 1 x Quick Start Guide
- 1 x Calibration certificate
- 2 x Declaration (CE, UKCA)

PV:1500 Clamp

- 1 x PV:1500 Clamp (wireless current clamp meter)
- 1 x Test lead set (red and black probes)
- 2 x AAA batteries
- 1 x Manual

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Order Information:

Instruments

| | Part Number |
|--|--------------------|
| PV:1525-IV Complete Kit (global version)* | 601A915 |
| PV:1525-IV instrument (global version)* | 601A916 |
| PV:1525 Complete Kit (global version)* | 601A910 |
| PV:1525 instrument (global version)* | 601A911 |
| SS:200LR Wireless Irradiance Meter (global version)* | 396A942 |
| PV:1500 Clamp | 601A1200 |

*Not for USA.

Optional Accessories & Replacements

| | |
|---|----------|
| Carry case | 71G101 |
| 4mm test probes with Alligator Clips | 601A1203 |
| Instrument to MC4 Test Leads | 601A1202 |
| Bypass measurement leads | 601A1201 |
| Rechargeable battery pack | 906A001 |
| Battery charging cradle | 906A021 |
| Solar Survey – Quick release panel mounting bracket | 396A979 |
| Solar Survey Quick Fix Dual Temp Probe | 396A980 |

601A528

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