WHO WANTS A SIMPLE TEST?

We Thought So.

Automated Test Systems & Power Test Instrumentation

www.InteproATE.com
THE POWER TEST EXPERTS

With more than 30 years of power testing expertise, Intepro Systems delivers quality solutions to your performance and delivery expectations.

From catalog products to integrated solutions, Intepro can simplify the testing of complex power devices to ensure our products meet or exceed the performance and reliability needed for demanding power applications.

Allocate your resources to your products; let Intepro handle your ATE needs.

Intepro provides test solutions for a wide range of industries including:

- Aerospace
- Renewable energy
- Automotive
- Industrial
- Military
- OEM power supply
- Power components
- Telecommunications

WHY WORK WITH INTEPRO

Innovative designs that drive performance

With access to thousands of catalog test and measurement instruments, we develop test solutions that are cost-effective without compromising performance. Our partnerships with leading suppliers allows us to take advantage of the latest technology and ensure long-term operability.

www.InteproATE.com
WHAT INTEPRO OFFERS

Intepro Test Solutions Include:

Turn-key systems for characterization, functional and accelerated power test for the following:

• AC/DC, DC/AC, and DC/DC power supplies
• Medical power supplies
• Battery for EV and HEV
• Aerospace components, motor drive test and semi-conductor power devices
• Renewable energy inverters for on-grid or off-grid PV and bi-directional EV chargers

ON-TIME, ON BUDGET

It’s at the top of the list for any company. Intepro doesn’t stop there. We factor in through-put, quality control, down time, servicing and expandability. Customers rely on our systems to reduce cost of ownership and provide long term operation. Let Intepro solve the problem of designing and building your ATE tester on time, on budget.
PRODUCTS AVAILABLE:
AUTO-RANGING PROGRAMMABLE DC POWER SOURCES

The PS and PSI Series of Auto-Ranging DC sources provide higher output currents and higher voltages across the sources’ power curve compared to traditional power supplies. This gives the user more voltage and current combinations from one smaller, lower-cost power supply. Auto-Ranging is like having several traditional power supplies in one.

<table>
<thead>
<tr>
<th>PS 9000</th>
<th>PSI 9000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chassis Size</strong></td>
<td>3U</td>
</tr>
<tr>
<td><strong>Power Range</strong></td>
<td>5kW-15kW</td>
</tr>
<tr>
<td><strong>Auto Range</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>High Voltage (&gt;750V)</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>High Speed Slew Rate</strong></td>
<td>&lt; 30msec</td>
</tr>
<tr>
<td><strong>Integrated Function Generator</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Parallel /Auxiliary for High Power</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Solar Simulation</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Fuel Cell Simulation</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Programmable Impedance</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>RS232</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>USB</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>LAN</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Modbus TCPB</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Profibus</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>CANopen</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>RS-488 (GPIB)</strong></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Isolated Analog</strong></td>
<td>✓</td>
</tr>
</tbody>
</table>

**PS 9000 SERIES**

Programmable DC Power Supplies from 1.5 kW to 15 kW, up to 1500 Vdc

The PS Series offers high density, fast rise times, accurate programming, low ripple and noise with a robust set of protection features accessible via HMI (Human Machine Interface) for easy operation.

- Up to 3 kW in 1U (1.75”)
- Fast rise times (<30msec)
- Up to 95% efficient
- CV, CC, CP control modes
- Standard USB, Ethernet and Isolated Analog interfaces

www.InteproATE.com
PSI 9000 SERIES

Intelligent Programmable DC Power Supplies
from 1 kW to 15 kW, up to 1500 Vdc

Integrated Function Generator and High Speed Slew Rates

The PSI Series offers increased performance for applications that demand fast response times, advanced power simulation modes and precision control. The series includes a galvanically isolated analog interface for voltage, current and power programming and monitoring, digital plug and play modules supporting RS232, Ethernet, CANopen, Modbus TCP, Profibus, Devicenet, and IEEE/GPIB and SCPI command language support.

- Integrated function generator allows the creation of arbitrary disturbances for complex testing
- Photovoltaic solar array and fuel cell simulation
- Programmable Output impedance
- Parallel multiple chassis for up to 150 kW
- Wide choice of remote interfaces available
- Options include: 15U and 24U configurations, water cooled and wide input power ranges from 400V to 480
PRODUCTS AVAILABLE:

REGENERATIVE ELECTRONIC LOADS

Intepro Systems’ line of regenerative loads offers all the necessary features of today’s modern electric loads with the added benefit of energy recovery to the mains. With the rising cost of energy and the need to meet sustainability objectives, our loads will lower your operational cost while reducing the heat in the work area by 93% compared to a traditional electronic load.

Regenerative technology is unique because it converts the supplied energy into a synchronous sine current, and then feeds it back into the local or public grid. This process eliminates usual load heat dissipation which simultaneously reduces energy costs. In addition, this feature offers a cost-effective alternative to expensive cooling systems previously required for conventional air- and water-cooled loads. Depending on usage, Intepro’s regenerative products pay for themselves rather quickly.

ELR 9000 SERIES

Regenerative Electronic DC Loads

3.5 kW to 105 kW up to 1500 Vdc in 3U

Four modes of operation include Constant Voltage (CV), Constant Current (CC), Constant Power (CP) and Constant Resistance (CR).

- Up to 95% efficient
- High Power Option
- Parallel and reconfigure up to 10 chassis for 105 kW to meet high power requirements
- FPGA-based control
- Integrated Function Generator
- Table-based regulation circuit for the simulation of non-linear testing
- Galvanically isolated DC input
- Field-upgradable Digital Remote Interfaces

www.InteproATE.com
ELR 5000 SERIES

Modular Regenerative Electronic DC Loads

320 W modules, 3200 W total per chassis, up to 200 V

Up to 10 channels of independently controlled loads, ideal for burn-in applications.

- 10 channels in a 6U chassis
- Up to 90% efficient for low heat dissipation
- Energy is recovered to the AC mains
- Full featured including an Integrated Function Generator
- Full featured table-based regulation circuit for the simulation of non-linear testing

<table>
<thead>
<tr>
<th>Load Type</th>
<th>EL 9000 B</th>
<th>ELR 9000</th>
<th>ELR 5000</th>
<th>EL 2000 HS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Channel</td>
<td>Single Channel</td>
<td>Multi Channel</td>
<td>Single Channel</td>
</tr>
<tr>
<td>Regenerative</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Input</td>
<td>DC</td>
<td>DC</td>
<td>DC</td>
<td>DC</td>
</tr>
<tr>
<td>Max Voltage Rating</td>
<td>750Vdc</td>
<td>1500Vdc</td>
<td>200Vdc</td>
<td>20Vdc</td>
</tr>
<tr>
<td>Wattage Range Per Chassis</td>
<td>1.2kW-7.2kW</td>
<td>3.5kW-10.5kW</td>
<td>320W</td>
<td>40W</td>
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<tr>
<td>Paralleling for Higher Power Levels</td>
<td>✓</td>
<td>&gt;105kW</td>
<td>3200W / Chassis</td>
<td></td>
</tr>
<tr>
<td>Typical Max Slew Rates</td>
<td>30μsec</td>
<td>&lt;1.5msec</td>
<td>&lt;1msec</td>
<td>0.350μsec</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>20kHz</td>
<td>1kHz</td>
<td>1kHz</td>
<td>1MHz</td>
</tr>
<tr>
<td>4 Modes of Operation CC, CR, CP, CV</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Pulse Mode</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Function Generator</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
PRODUCTS AVAILABLE:

PROGRAMMABLE ELECTRONIC DC LOADS

EL 9000 B SERIES

*Single Channel DC Electronic Loads*

*1.2 kW to 7.2 kW, up to 750 Vdc in 3 U*

The EL 9000 B is a high performance rack mount load with six modes of operation from 1.2 kW to 7.2 kW.

- Integrated Function Generator allows the creation of arbitrary disturbances for complex testing
- Parallel multiple chassis for up to 72kW for high power requirements
- Table-based regulation circuit for the simulation of non-linear testing
- Wide choice of remote interfaces available
- Optional water-cooled units available

EL 2000 HS SERIES

The EL 2000 HS Series is a high-speed DC load providing point of load (POL) connections and point of use (POU) for high slew rate DC loading. The EL 2000 HS is a stand-alone modular load for testing one device or group modules together for multi device testing. The smart on-board load head minimizes inductance, resistive losses and noise associated with typical loads that use wires to connect the device under test (DUT) to the load. With the increasing demand for high speed semiconductors, operating voltages are decreasing for minimizing the heat dissipation in devices.

- Smart on-board load head (minimizes inductance)
- High speed slew rates
- High speed digitizer for high sampling rates
- 4 modes of operation; CC, CR, CP and CV
- Ethernet control and read back
- Standard and custom solutions available
- Modular stand-alone design
- High speed transient response loading
- Sinks full rated current with only 0.3 V applied to load head

[www.InteproATE.com](http://www.InteproATE.com)
PRODUCTS AVAILABLE:

PROGRAMMABLE ELECTRONIC BI-DIRECTIONAL DC POWER SUPPLY

PSB 9000 SERIES

The PSB 9000 Series incorporates two devices in one: a power supply (source) and an electronic load (sink) with energy recovery. The PSB 9000 Series has the functionality of two-quadrant operation as a standard. The device is a full electronic load with an energy recovery feature, such as in our ELR 9000. In source operation mode, the device becomes a flexible, auto-ranging power supply like our PSI 9000 Series. The PSB 9000 eliminates the need for another unit and saves our customers on space, weight, and cost to implement them into custom test software.

- AC connection: 360…528 VAC
- No derating in sink mode
- Energy recovery with high efficiency
- Power ratings: 5 kW, 10 kW or 15 kW,
- Expandable up to 240 kW
- Voltage ratings: 60 V up to 1500 V
- Current ratings: 30 A up to 510 A
- Flexible, power regulated DC<->AC stage
- Various protection circuits (OVP, OCP, OPP, OTP)
- Intuitive TFT touch panel with display for values, status and notifications
- Galvanically isolated, analog interface
- Integrated function generator
- Photovoltaic array simulation, battery test
- MPP tracking simulation
- Two-quadrants operation mode
- USB port integrated
- Optional, digital interface modules
- SCPI command language and ModBus RTU
- LabView support by VI package
The Intepro AC power sources are the value leaders in the market. From the basic programmable voltage and frequency models to the advanced bi-directional grid simulator, Intepro has the solution. Power levels from 500 VA to 2 MVA are available in single and three phase output, including independent phase control.

Applications and Features Include:

- Production Functional Testing of Power Supplies
- Value-Leaders: basic programmable voltage; frequency models; to advanced grid-simulator models
- High value / low kVA-per-dollar models
- From 500 kVA to 2 MVA
- Grid Simulator with four quadrants regenerating >90% back to the grid
- Ideal for compliance or avionics testing

<table>
<thead>
<tr>
<th></th>
<th>AFC</th>
<th>AMF</th>
<th>AFV-P</th>
<th>AFV</th>
<th>PAS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Range</strong></td>
<td>0.5KVA-2MVA</td>
<td>6-300KVA</td>
<td>600VA-5000VA</td>
<td>15KVA-2MVA</td>
<td>45KVA-200KVA</td>
</tr>
<tr>
<td><strong>Voltage Range</strong></td>
<td>5V-150VL-N</td>
<td>115VL-N</td>
<td>115VL-N</td>
<td>150VL-N</td>
<td>150VL-N</td>
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<tr>
<td></td>
<td>+/-10%</td>
<td>+/-10%</td>
<td>+/-15%</td>
<td>+/-15%</td>
<td>+/-15%</td>
</tr>
<tr>
<td><strong>Frequency Range</strong></td>
<td>Frequency Range</td>
<td>350-450Hz</td>
<td>15-1000Hz</td>
<td>45-500Hz</td>
<td>45-65Hz</td>
</tr>
<tr>
<td><strong>THD%</strong></td>
<td>0.5%</td>
<td>&lt;2%</td>
<td>&lt;3%</td>
<td>&lt;40-100Hz 0.3%</td>
<td>&lt;2%</td>
</tr>
<tr>
<td></td>
<td>&lt;2%-3%</td>
<td>&lt;3%</td>
<td>&lt;3%</td>
<td>&lt;2%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td><strong>Transient Generation</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Overload Drive</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Measurements</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Independent Phase Control</strong></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Bi-Directional Regenerative</strong></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

www.InteproATE.com
AFC SERIES

AFC Series products are single and 3-phase AC Power Sources ranging from 0.5 kVA to 2000 kVA. This AFC Series has a continuous, adjustable output voltage between 5 and 300 V. This feature allows for fast, convenient 3-scales of preset voltage for high- and low-voltage simulation. With up to 90% efficiency, the AFC Series minimizes heat dissipation so less infrastructure cooling is required.

- Precision frequency and load regulation
- Compact design that minimizes floor space requirements
- Low output distortion
- Integrated high accuracy measurements

AMF SERIES

Intepro Systems’ AMF Series is a complete suite of single and 3-phase 400 Hz AC Frequency Converter Products.

With power levels ranging from 6 kVA to 300 kVA, the AMF Series of frequency converter products are ideal, cost-effective solutions that are ideally suited for precise frequency conversion in all avionics and higher-frequency electronic applications.

- Precision frequency control and load regulation
- Single- or 3-phase output
- Low-output distortion
- Integrated high-accuracy measurements
- Overload capacity of up to 200% for 15 seconds
- Isolated input and output
- Laminated bus-bar technology reduces induction and improves reliability
AFV-P SERIES

Intepro Systems’ AFV-P Series is a programmable AC/DC output power source, with precision measurement and control. This compact power source offers three power levels: 600 VA, 1250 VA, 5000 VA. The AFV-P Series provides clean power with distortion measuring less than 0.3% while operating at 40 to 100 Hz. This Series also delivers output voltage from 0 to 310 VAC, and delivers frequency from 40 to 500 Hz, as well as a high-frequency option from 15 to 1000 Hz.

The AFV-P Series is ideal for use in the following industries and environments:

• Commercial
• Defense
• Aerospace
• Test Applications from Design Verification; Quality Assurance; ATEs
• The AFV-P Series includes Graphical Users Interface Software to simplify complex testing of the AC Input to the UUT

• Extend the applications to DC type testing with DC Output
• 0-310 V L-N; 15-1000 Hz
• Output current maintains constant based on the load while output voltage varies
• 2U: 600 VA / 1250 VA / 2500 VA; 5U: 5000 VA
• Capable of delivering up to 4.5 times of peak current
• THD is less than 0.3% when output frequency is less than 100 Hz

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**AFV SERIES**

The AFV Series is Intepro Systems’ broad line of programmable 3-phase AC Power Sources. Power levels range from 15 kVA up to 2 MVA. The AFV Series’ powerful FPGA+ARM-based Controller offers precise voltage and frequency conversion with power disturbance generation capabilities.

Power is supplied via state-of-the-art IBGT pulse-width-modulated amplifiers. This results in highly efficient power conversion and maximized performance—all wrapped up in a compact design.

- A running event recording function records up to 255 events
- Advanced SPWM technology and direct digital frequency synthesis (DDS) waveform technology are used.
- Self-diagnostic maintenance function which offers higher system reliability and downtime protection.
- The IPC option allows independent phase angle and voltage control for testing against phase unbalance for three phase products

**PAS-F SERIES**

Intepro Systems’ PAS-F Series is a broad line of programmable 3-phase output regenerative utility, grid-simulator products.

Power levels range from 45 kVA up to 1.6 MVA, meaning this series is capable of testing the largest dispersed energy inverters.

The PAS-F Series combines utility grid-simulation with regenerative, bi-directional AC source-controlled power. This Series is capable of both source and sink full-current from the Equipment-Under-Test or EUT.

- Absorbs energy from the output terminals and feeds it into the grid power, helping the industry to conserve energy and reduce carbon emission.
- Uses the most advanced PWM rectification (active rectification) technology with four-quadrant operation capability
- Very high input power factor, up to 0.99 pf
- Pure sinusoidal output voltage, THD < 1%
- Sinks 100% reactive power (kVAR)
- Independent phase control
PRODUCTS AVAILABLE:
**PROCYON ATE SYSTEMS**

When it comes to ATE Test Systems for a low to high volume production, Intepro has what you need. For over 30 years, Intepro has designed, built and integrated power supply test equipment for the world’s largest and smallest power supply manufacturers. Our customers benefit from our fast, cost-efficient solutions that include our own specialty hardware and pre-selected commercial instruments to cut their production, design characterization, life-cycle and repair costs.

PRODUCT MANAGEMENT

Intepro Systems follows a structured approach in specifying and implementing test systems for its customers. Projects we manage are coordinated via a dedicated Project Engineer who works directly with you during each phase of the project from start-to-finish.

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TYPICAL PROCYON 2100-10 TEST SYSTEMS

1. Safety Interlock and Emergency Stop Module
2. Back Up UPS
3. Oscilloscope
4. Modular DC Source
5. DMM and Frequency Generator
6. Spectrum Analyzer
7. VXI / PXI Chassis
8. UUT Mass Interconnection
9. Industrial Computer
10. Modular Loads
11. Low Power DC Supply
12. High Power DC Supply
13. High Power DC Load

STANDARD LIBRARY TESTS INCLUDE:

OUTPUT PERFORMANCE
- DC Output Voltage
- Ripple and Noise
- Efficiency
- Overshoot Voltage
- Voltage Dropouts
- Dynamic

INPUT CHARACTERISTICS
- Frequency Range
- Power Analyzer Data
- High Line/Low Line
- Line disturbance
- Safety

REGULATION TEST
- Cross Regulation
- Load Regulation
- Line Regulation

RESPONSE AND TIMING
- Transient Response Time
- Spikes and Drops
- Line Transient

PROTECTION TEST
- Short Circuit
- OC, OV and OP Protection
- Remote Shutdown Protection

SPECIAL TEST
- Communication
- Status Signals
KEY FEATURES

• R&D and production ATE’s
• Power from 1 W to over 1 MW
• Single and multi-channel
• Scalable solutions
• Regenerative technology

• Auto-ranging DC sources
• Open-architecture hardware supporting LXI, IEEE, VXI, PXI and AXI
• High speed data acquisition
• Powerful open frame test executive software

PRODUCTS AVAILABLE:
CUSTOM SOLUTIONS

Intepro Systems works with our customers to find the ideal solution to your power testing problem. Here are some examples of custom solutions we have created for some of our customers

CUSTOM DESIGN ATE LAYOUTS

Intepro Systems can build any system to fit your needs and your testing environment depending on your volume. We can create solutions comprised of up to 5 Bays. We also have expertise in building desktop systems.
CUSTOM DESIGN FIXTURE LAYOUTS
Intepro Systems works with customers to find solutions to problems that typically don't have straight answers. We have created fixtures that have met design, testing and volume constrains that have stood the test of time. From a simple PDU to a complicated fixture - Intepro has you covered.

POWER DISTRIBUTION UNITS (PDU)
Custom designed or build to print PDU manufacturing. Short design cycles for AC or DC power distribution.

TEST FIXTURES
For customers who need a complete turnkey test platform, Intepro Systems provides fully integrated test fixtures and software programs with your test systems. These fixtures can be integrated with your automation systems and designed to be safely operated.

SELF-TEST FIXTURES
A self-test fixture is able to carry out an automatic functional check on the test system hardware. The system leverages internal hardware to test functional operation of the system.

CALIBRATION FIXTURE
Intepro provides breakout fixtures to simplify the calibration of the test station.
THE INTEPRO ADVANTAGE

*Universal Design Grows with You*

Intepro’s universal hardware building block approach optimizes operation and reduces risk.

- Simple transition from R&D to production
- One system tests multiple products
- Leverage existing system designs for your next generation products
- Models or brand of hardware is easily exchangeable
- PowerStar test suites are hardware independent

CUSTOM DESIGN INTEGRATIONS

We can create solutions from a variety of our instruments and bring them together in a way you may have not thought possible.

OUR SYSTEMS

Our configurable test platforms include:

- **PST2100-10**
  DC/DC Power Supply Test Systems
- **PST2100-20**
  Battery Test Systems
- **PTS2100-30**
  Electric Vehicle Test Systems
- **PTS2100-40**
  Energy Conversion Test Systems
- **PTS2100-50**
  Life Cycle Test Stations / Burn In
- **PTS2100-60**
  Power Semiconductor Test Systems
- **PTS2100-70**
  DC/AC Power Supply Test System
- **PTS2100-80**
  AC/DC Power Supply Test System

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LEGACY UPGRADE OR REPLACEMENT

- Form, fit and functional solutions to replace legacy test program sets
- Leverage existing cables and test program sets
- Repurpose operational hardware and upgrade the rest

SOFTWARE

*PowerStar Software™ Programming without Coding™*

- Eliminates the need for complex programming
- Quick and simple testing
- Seamless transition from design to manufacturing
- Hardware independence test programs
- Executes LabVIEW test sets
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