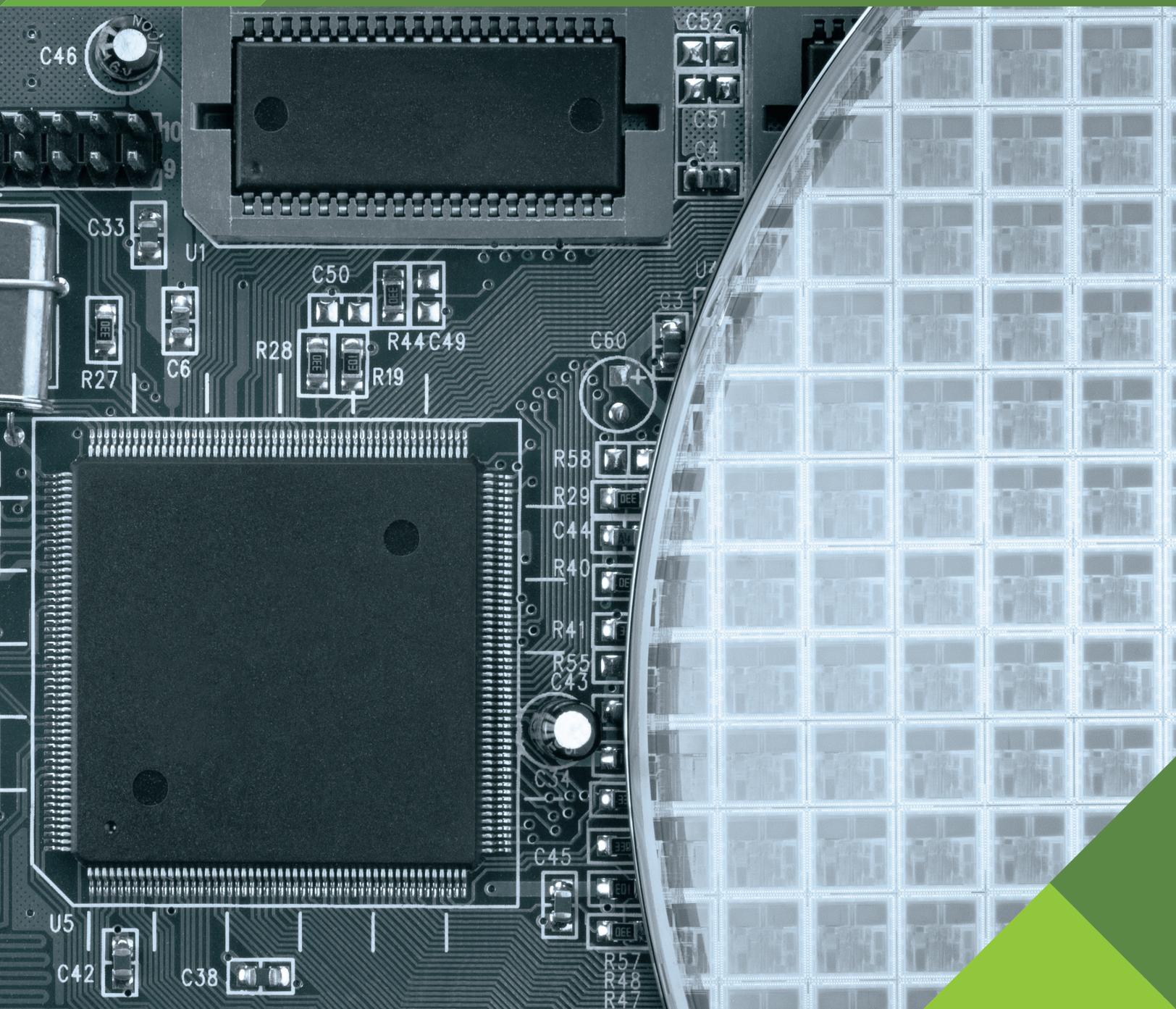


# ASCENT<sup>®</sup> SMS AP10 DC POWER SUPPLIES

ADVANCED SINGLE-MAGNETRON SPUTTERING



## Overview

The Ascent SMS AP10 DC power supply provides a leap ahead in configurable performance. Its four-block progressive arc management system with full voltage reversal offers the lowest arc energy in the industry. Available self-adjusting arc parameters dynamically move with the process. The AP waveform delivers boost voltage, reverse voltage control, and advanced pulse shaping that enables fine-tuning to tailor film morphology and desired film properties.

Refine your process and leverage machine learning, modern data science, and advanced analytics with the PowerInsight by Advanced Energy™ IoT solution. This available embedded data collection, visualization, and analysis platform transforms data into actionable intelligence.

## Product Highlights

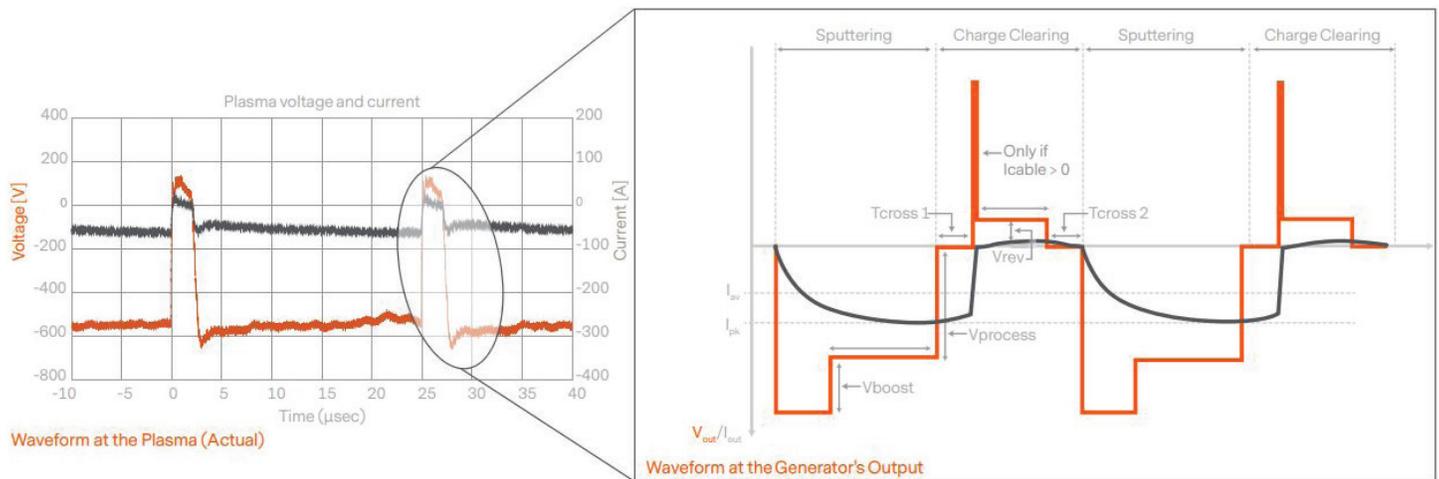
- **Arc Management System™ Technology** – Progressive arc handling blocks maintain plasma through arc events while increasing process control and lowering arc energy.
- **SOA and Frequency Range** – The Ascent SMS AP 10 operates up to 1200 V and 25 A with frequencies from 5 to 150 kHz.
- **Ascent Communications** – Options include the latest digital communication methods as well as legacy communications to provide ease of integration with the latest tools and backwards compatibility with legacy tools.
- **Ascent Sync** – Pulse and arc synchronization enable coordination with Ascent pulsed DC and AE's RF products.
- **Ascent AP Waveform Controls** – Ascent AP offers the most configurable waveform for better control of processes with adjustable reverse voltage, boost voltage, and adjustable dead times.
- **PowerInsight by Advanced Energy™** – Advanced Energy's optional embedded IoT solution enables advanced data collection, visualization, and analysis.

## Applications

- Semiconductor and Advanced Packaging Manufacturing – Reactive metal deposition (PVD)
- Flat Panel Display and Optoelectronics – LCD, (O)LED, TFT, MEMS (PVD and PECVD)
- Photovoltaics and Thin-Film Battery – PERC, Topcon, HJT (PVD and PECVD)
- Mobile Decorative, Optics, and Photonics – Metal and dielectric high precision optical layers (PVD)
- Industrial Coatings – Pulsed-DC and RF/DC sputtering applications

## Single-Magnetron Sputtering of Reactive and Conductive Materials

Use as a single-magnetron sputtering supply or as a bias supply.



A patented boost circuit on the leading edge of the sputtering waveform accelerates delivery of power to the process compared to a sine wave generator. The reverse portion of the waveform maximizes control, allowing more definitive charge clearing during reverse cycle.



## Specifications

Ascent SMS AP 10 Power Supply	
Power	10 kW
Voltage	1000 VDC operating, 1200 VDC boost, 1500 VDC ignition
Peak Current	33.33 A
Average Current	25 A
Frequency	5 to 150 kHz
Reverse Time (Max)	15 $\mu$ s
Duty Cycle	> 60% ON time
Reverse Voltage	300 V

Ascent SMS AP 10 Power Supply	
Pulse Configuration	Pulsed DC
PowerInsight Sample Rate	Up to 10 Hz (standard)
PowerInsight Storage	32 GB (SD storage expansion support)
FastDAQ Event Capture Sample Rate	Up to 40 MHz
Data Storage	Up to 3 months of high-resolution data or up to 12 months of down-sampled data

## PowerInsight Offerings

### Built-in Module

Direct LAN Ad-hoc Connectivity or Fab Network LAN Connectivity via LAN/Ethernet Port

### Real Time Dashboard

Monitor power delivery variables and indicates faults/warnings using the onboard web application.

### Flight Recorder

View historical performance (evolution), review events and process steps (pan, scan, zoom), and store up to three months of data (longer with down sampling)

### Support Tool

Enable remote troubleshooting by uploading to the PowerInsight Cloud and downloading data to be explored manually (human readable)

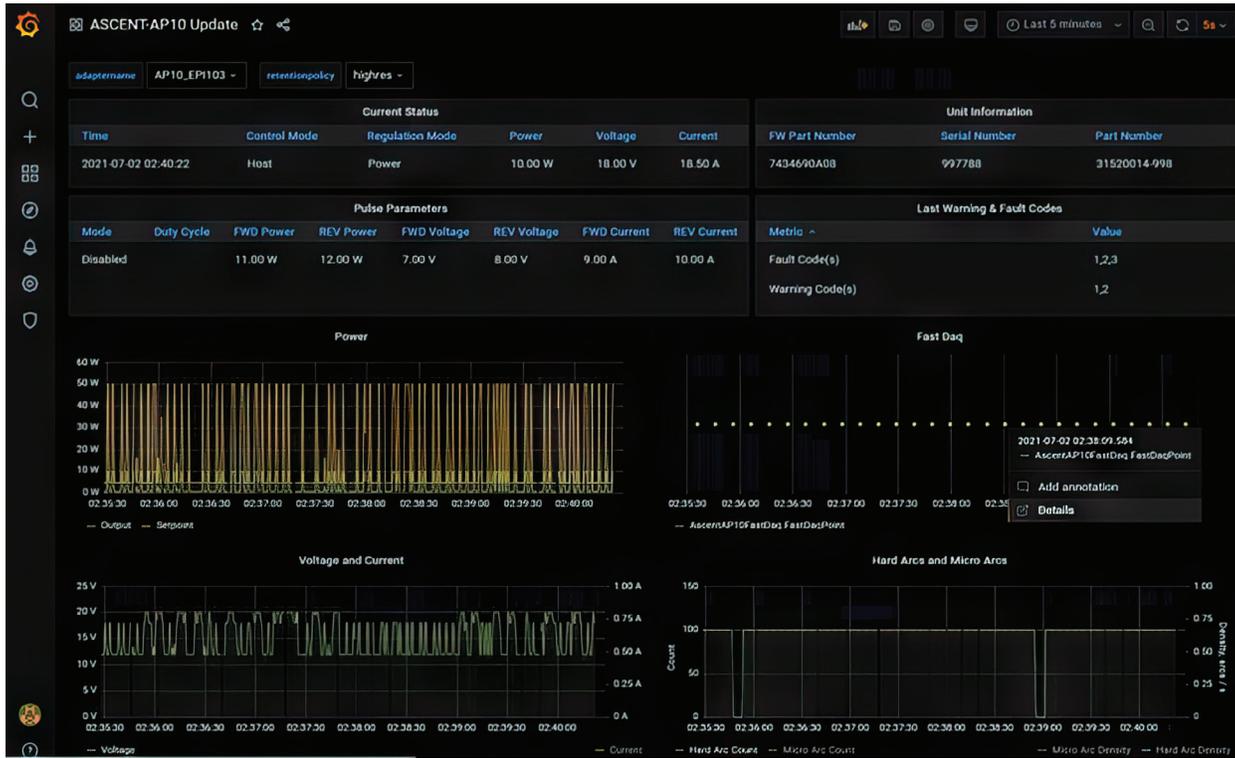
### Collaboration Tool

Develop additional analytics and identify improvements to the process and product

### FastDAQ Visualizer and Recorder

Capture, store, and review triggered events using configurable navigation tools (fields, zoom, etc.)

# PowerInsight Dashboard



# FastDAQ™ Event Capture





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## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

PRECISION | POWER | PERFORMANCE | TRUST

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