

ADVANCED ENERGY® GLOBAL SERVICES

AFTERMARKET SERVICES AND
END-OF-LIFE SOLUTIONS | 2025

CERTIFIED SERVICESSM





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Advanced Energy Global Services

Only AE combines best in-class quality with
flexible programs and fast turnaround time

Best-in-Class Global Service Support

Maximize productivity and reduce total cost of ownership with world-class support for every stage of the product lifecycle. Advanced Energy's (AE) service offerings are based on more than three decades of precision power, thermal imaging, and pyrometry expertise. We think beyond standard service models to develop our world-class service support. By combining years of historical field data and a vast library of feature-set improvements, we can prevent potential failures and extend the life of your tools.



REPAIR & CALIBRATION SERVICES

- Highest-quality repair with quick turnaround, using only AE-qualified, original parts
- Stringent test procedures followed with proprietary test equipment and software
- Access to essential upgrades and preventative maintenance
- Calibration to keep products operating to their original manufacturer specifications



INNOVATIVE OFFERINGS

- Refurbishment programs replace time-dependent components and extend product life
- Retrofit and replacement options replace existing, aged products with new transparent solutions
- Flexible exchanges provide lead-time relief and limit tool downtime by providing access to spares



CUSTOMIZED SOLUTIONS

- Engineered solutions add custom features and functionality specific to your needs
- World-class field service and application support for real-time troubleshooting
- PowerInsight by Advanced Energy™ platform transforms data into actionable intelligence



SERVICE AND SUPPORT AT EVERY STAGE OF

EXTENDED WARRANTIES ●

Whole-box extended warranties are available for new or used products, units approaching their warranty expiration, and repaired units.

EXCHANGE PROGRAMS ●

Set up a custom exchange program of managed spares to reduce capital equipment investment and minimize downtime associated with routine maintenance and repair.

TECHNICAL SUPPORT ●

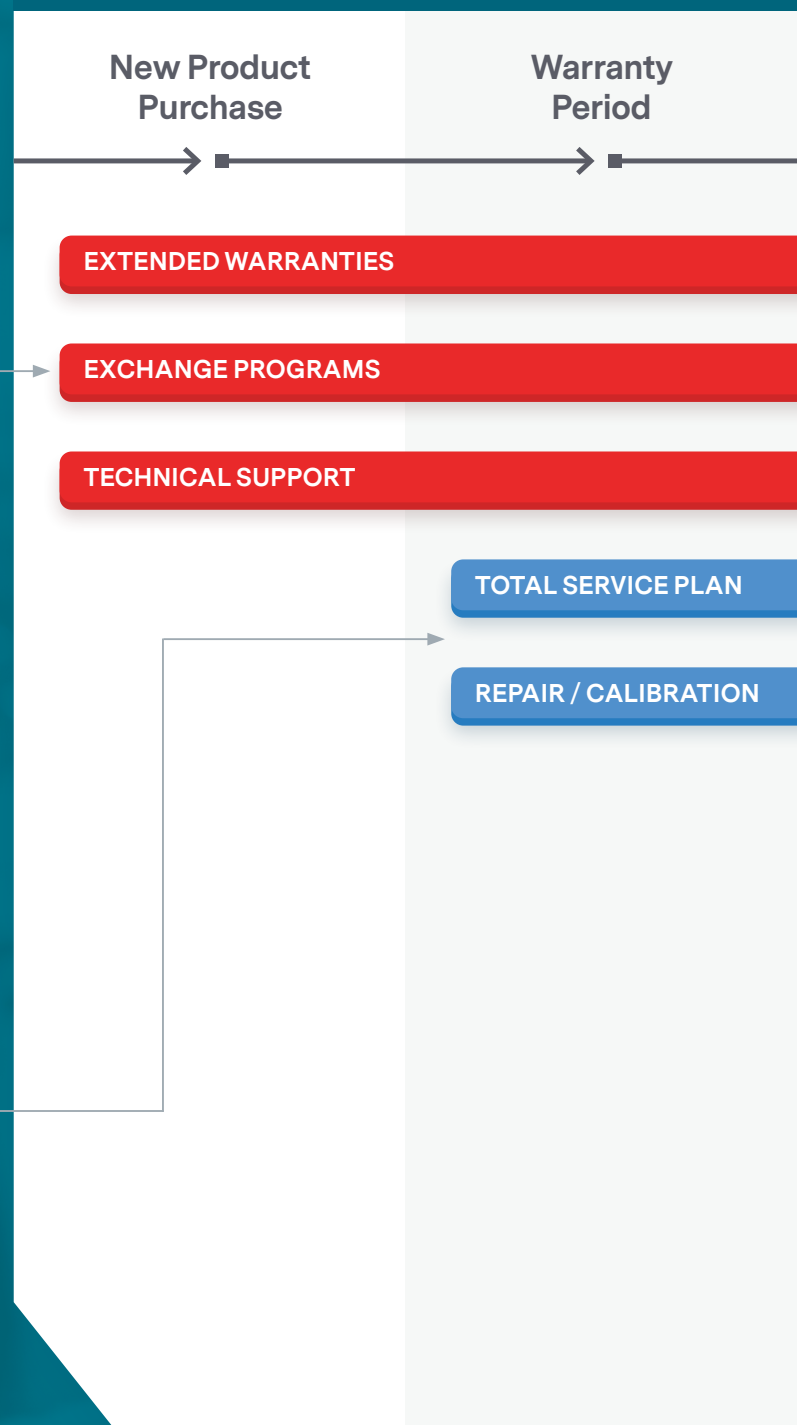
Reach our talented support staff 24 x 5 across the globe. We respond quickly to every situation, perform with world-class excellence, and insist only on the highest quality standards.

TOTAL SERVICE PLAN ●

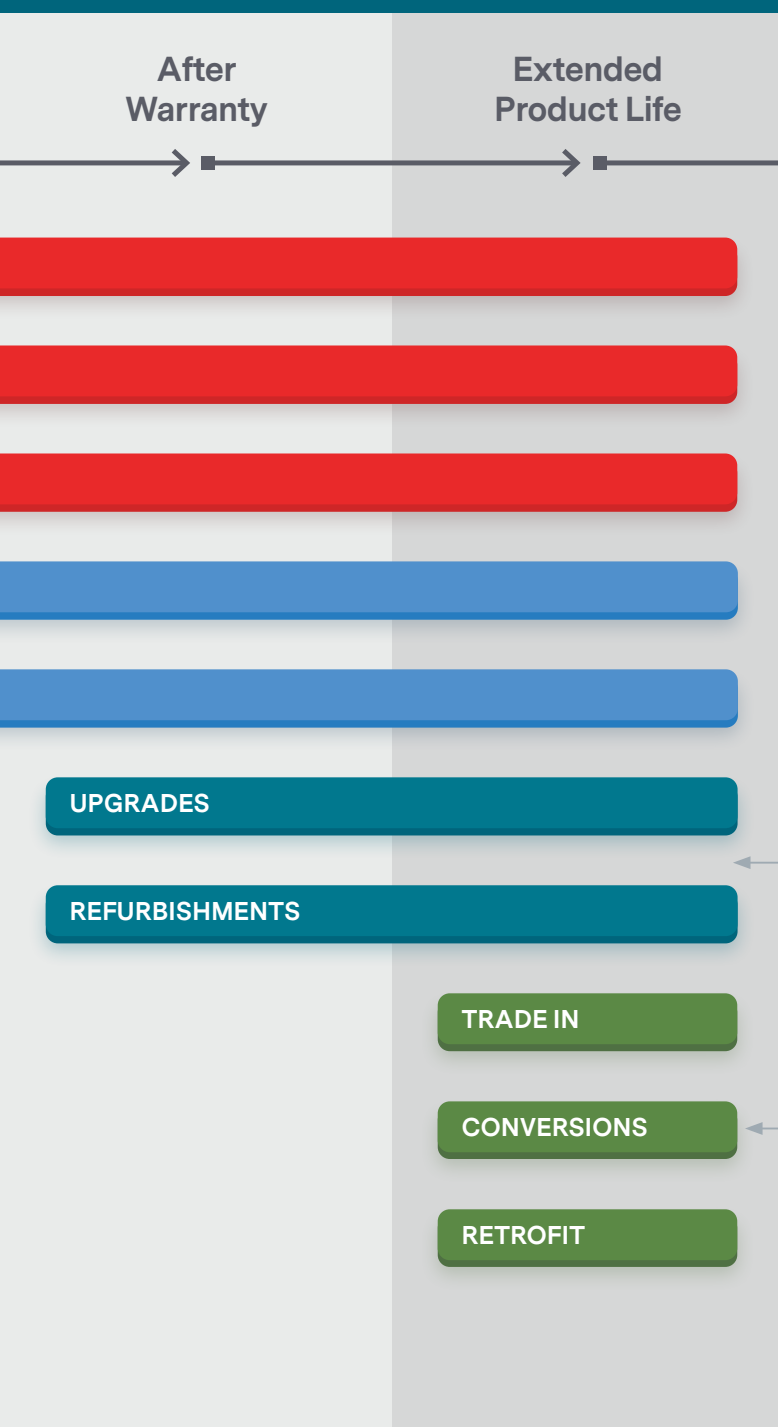
Reduce annual maintenance costs and simplify forecasting by building a custom service plan into your annual operating budget.

REPAIR / CALIBRATION ●

Our worldwide service centers provide fast cycle times, use only AE-qualified parts, and follow the original product's specifications and test procedures for the highest quality repair or calibration.



SUPPORT OPTIONS FOR OF THE PRODUCT LIFECYCLE



○ UPGRADES

Take advantage of the latest engineering innovations to optimize long-term product performance. Add custom-engineered solutions to utilize new feature sets and functionality.

○ REFURBISHMENTS

Extend product life and reduce mean time between failure by replacing time-dependent components during reactive or preventative maintenance.

● TRADE IN

Leverage your original investment and reduce the cost of a new unit by trading in your old unit.

● CONVERSIONS

Convert your outdated AE unit to a newer version to extend product life and add new features for a fraction of the cost of a new purchase.

● RETROFIT

Replace existing, aged, discontinued or un-repairable devices of any make and model with a new and transparent solution.

Comprehensive Retrofit Options for Legacy Tools

Retrofit						
Legacy Platform	Status	Retrofit Kit P/N	Retrofit Kit Description	Tool/Application	OEM Qualified	PowerInsight Compatible*
AZX10	Discontinued	3175301-610	AZX10 to Nav II Retrofit Kit	LAM Rainbow Etch	No	Yes
HFV	Obsolete	3176730-615	HFV 5 kW to Paramount 5002 OIPT Tools		Yes	Yes
	Obsolete	3176730-630	HFV 3 kW to Paramount 5002 3 kW Retrofit Kit		Yes	Yes
	Obsolete	3176730-650	HFV 5 kW to Paramount 5002 5 kW Retrofit Kit		Yes	Yes
MDX	Obsolete	3176760-012	MDX-L 12 kW to Pinnacle III 12 kW Retrofit Kit	PVD, Endura	Yes	Yes
	Obsolete	3176760-018	MDX-L 12 kW / 6 kW system to Pinnacle III 18 kW Retrofit Kit	PVD, Endura	Yes	Yes
	Obsolete	3176760-018	MDX-L 18 kW to Pinnacle III 18 kW Retrofit Kit	PVD, Endura	Yes	Yes
	Obsolete	3176760-118	MDX-L 18 kW to Pinnacle III 18 kW Retrofit Kit		Yes	Yes
	Obsolete	3176760-606	MDX-L 6 kW to Pinnacle III 6 kW Retrofit Kit	PVD, Endura	Yes	Yes
	Obsolete	3176760-616	MDX-L 6 kW HALO to Pinnacle III 6 kW Retrofit		Yes	Yes
	Obsolete	3176760-014	MDX-L 12 kW to Pinnacle III 12 kW Retrofit Kit		Yes	Yes
	Obsolete	3176760-615	MDX II 30 kW to Pinnacle III 15 kW Retrofit kit	SPTS 200 mm Sputter	No	Yes
MFA / RFG2K2V	Discontinued	3172000-200	MFA TO NAV1, 2013-L35Z, STINGER	AMAT Centura	No	Yes
	Discontinued	3172000-201	MFA TO NAV1, 2013-L35Z, SPECIAL	AMAT Producer	No	Yes
	Discontinued	3172000-202	MFA TO NAV1, 2013-L35Z, STINGER, 7M WATER LINES	AMAT Centura	No	Yes
	Discontinued	3172000-203	MFA TO NAV1, 2013-L35Z, SPECIAL. 7M WATER LINES	AMAT Producer	No	Yes
OR2000/OR4000	Obsolete	957-4005-01	OR2000 or OR4000 to 4100T RTP Retrofit	4ch RTP	N/A	No
	Obsolete	957-3001-01	OR2000 or OR4000 to 4100T RTP Retrofit	3ch RTP	N/A	No
	Obsolete	957-4006-00	OR2000 or OR4000 to 4100T CVD Retrofit	200mm CVD	N/A	No
	Obsolete	957-4007-00	OR2000 or OR4000 to 4100T CVD Retrofit	300mm CVD	N/A	No
PDW2200	Obsolete	3170011-000	PDW2200 to Paramount MF Retrofit Kit	LAM Etch Tool	No	No

Retrofit (continued)						
Legacy Platform	Status	Retrofit Kit P/N	Retrofit Kit Description	Tool/Application	OEM Qualified	PowerInsight Compatible*
PDX5000	Obsolete	3170312-200	PDX5000 to Paramount MF Retrofit Kit		No	No
	Obsolete	3170312-201	PDX5000 to Paramount MF Retrofit Kit Twst Lck		No	No
PDX8000	Obsolete	3170313-000	PDX8000 to Paramount MF Retrofit Kit		No	No
Pinnacle II	Discontinued	31512416-670	PNCL3K to dual PNCLIII 1.5K Retrofit	Hard Disk Market	No	Yes
Rapid F	Obsolete	3170008-000	Rapid F to Xstream Retrofit Kit	5200HDP CVD AMAT P/N 0190-02348	No	Yes
RFG	Obsolete	3176712-004	RFG 1250 to Paramount 1250 Retrofit kit	LAM 9600	Yes	Yes
	Obsolete	3176712-005	RFDS 1250 to Paramount 1250 Retrofit kit	LAM 9600	Yes	Yes
	Obsolete	3176712-006	RFG 1250 to Paramount 1250 LAM TC9400DFM Kit	LAM Alliance TC9400DFM	Yes	Yes
	Obsolete	3176712-007	RFDS 1250 to Paramount 1250 LAM TC9400DFM Kit	LAM Alliance TC9400DFM	Yes	Yes
	Obsolete	3176712-008	RFG1250 TO PMNT1250 RETROFIT, CUSTOM	LAM 9600	Yes	Yes
	Obsolete	3176712-009	RFDS1250 TO PMNT1250 RETROFIT, CUSTOM	LAM 9600	Yes	Yes
	Obsolete	3176712-010	RFDS1250 TO PMNT1250 CUSTOM RETROFIT	LAM 9600	Yes	Yes
	Obsolete	3176712-011	RFG1250 TO PMNT1250, CSTM RF - LINE CBL	LAM 9600	Yes	Yes
	Obsolete	3176712-012	RFG1250 TO PMNT1250 RETROFIT, 5FT LC	LAM 9600	Yes	Yes
	Obsolete	3176712-013	RFG1250 TO PMNT1250 RETROFIT, 440CM RF CBL	LAM 9600	Yes	Yes
	Discontinued	3176720-100	RFG 2K2V to Paramount 2013 Retrofit (w/ Navl MFA)	AMAT Centura/Producer	No	Yes
	Discontinued	3176720-615	RFG 2K2V to Paramount 2013 Retrofit Kit w/ WC MFA	AMAT Centura/Producer	No	Yes
	Discontinued	3156330-636	RFG 300X to Paramount 3013 Retrofit	Axcelis Paradigm_XE, Mattson Aspen 3	Yes	Yes
	Discontinued	3176750-003	RFG5500 to Apex 5513 Retrofit		Yes	Yes
	Discontinued	3176750-005	RFG5500 to Paramount 5513 Retrofit		Yes	Yes
	Discontinued	3176750-006	RFG5500 to Paramount 5513 Retrofit MC		Yes	Yes
	Discontinued	3176750-007	RFG5500 to Paramount 5513 Retrofit Twist Lock		Yes	Yes
	Discontinued	3176750-008	RFG5500 to Paramount 5513 5ft LC		Yes	Yes
	Discontinued	3176750-009	RFG5500 to Paramount 5513 10ft LC		Yes	Yes
	Discontinued	3176750-010	RFG5500 to Paramount 5513 15ft LC		Yes	Yes

GLOBAL SERVICES

Retrofit (continued)						
Legacy Platform	Status	Retrofit Kit P/N	Retrofit Kit Description	Tool/Application	OEM Qualified	PowerInsight Compatible*
RFG	Discontinued	3176750-011	RFG5500 to Paramount 5513 20ft LC		Yes	Yes
	Discontinued	3176750-012	Retrofit RFG5500 to PMNT5513 120" LC		Yes	Yes
	Discontinued	3176750-013	RFG 5500 to Paramount 5513 Tube Fitting		No	Yes
RFPP	Obsolete	3176720-001	RF20M 3150020-014 to PMNT 2002 208V Retrofit		No	Yes
	Obsolete	3176720-002	RF20M 3150020-017 to PMNT 2002 400V Retrofit		No	Yes
	Obsolete	3176720-004	RF20S 3150075-000 to PMNT 2013 Retrofit		No	Yes
	Obsolete	3176730-003	RF30S 3150017-009 to PMNT 3013 Retrofit		No	Yes
	Obsolete	3176730-002	RF30S to PMNT 3013 Retrofit		No	Yes
	Obsolete	3176730-103	RF30S to PMNT 3013 Retrofit 6.5' cord		No	Yes

Refurbishment & Upgrades						
Legacy Platform	Status	Refurbishment Kit P/N	Refurbishment Kit Description	Tool/Application	OEM Qualified	PowerInsight Compatible*
Apex	Discontinued	315611X-XXX	Apex Coldplate Upgrade		No	No
Navigator	Discontinued	3165371-00 3165372-00	Navigator Ultra Life Capacitor Upgrade		No	No
Paramount 3013	Active	3156330-XXX	PMNT 3013 CIP Upgrades	Implant	Yes	Yes
HiTek A403	Active	311-004157-1100	HiTek Standard Refurbishment	Ion Implanter	No	No

Refresh						
Legacy Platform	Status	Product P/N	Kit Description	Tool/Application	OEM Qualified	PowerInsight Compatible*
Apex 3K2P	Discontinued	3156114-348	Apex 3K2P Refresh	CVD	Yes	Yes
AZX72	Discontinued	3155031-653	AZX72 Refresh	Ultima/CVD	Yes	No
RFG 2K2V	Discontinued	3155053-607	RFG 2K2V Refresh (Generator Only)		Yes	No
	Discontinued	3175002-101	RFG 2K2V Refresh w/MFA w/o Stinger	AMAT Producer CVD	Yes	No
	Discontinued	3175002-102	RFG 2K2V Refresh w/MFA w/ Stinger	AMAT Centura CVD	Yes	No

Conversion						
Legacy Platform	Status	Conversion Kit P/N	Kit Description	Tool/Application	OEM Qualified	PowerInsight Compatible*
Apex 3K2P	Discontinued	3165495-00 3165496-00 3165497-00 3165498-00	Apex 3K2P Conversion to 3K5P		No	No
Navigator 3013	Discontinued	3165507-00 3165411-00	Nav 3013 3155132-013 & -713 to 3155132-743			Yes
Paramount 1513	Active	3165374-00	Paramount 1513 Conversion to 3156310-626		Yes	Yes
Paramount 6013	Discontinued	3165472-00	Paramount 6013 Conversion	LAM	Yes	Yes
	Discontinued	3165420-00	Paramount 6013 Conversion	LAM	Yes	Yes
PMNT 5002	Active	31650042-00	Paramount 5002 CIP Conversion		Yes	Yes
PMNT 15002	Active	31650012-00	Paramount 15002 CIP Conversion		Yes	Yes

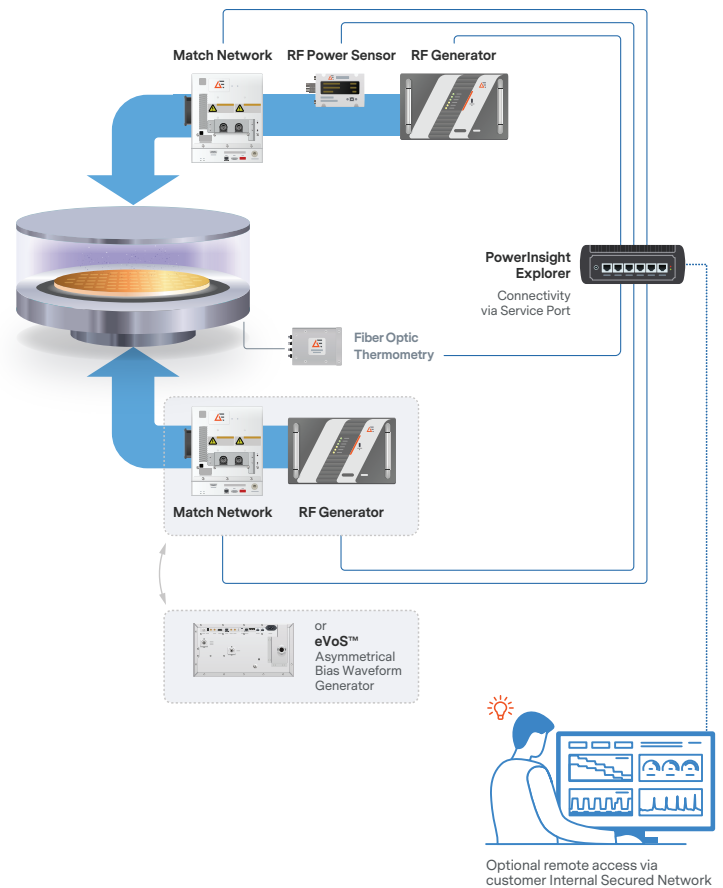
Accessories						
Platform	Status	Product P/N	Product Description	Tool/Application	OEM Qualified	PowerInsight Compatible*
Installs with Ascent DMS/Crystal	N/A	31500000-600	Diode Clamp Accessory for DMS	Industrial Glass Coating	No	No
MFA / RFG2K2V	N/A	21520594-00	MFA Stinger	AMAT Centura	No	No

* This column shows which retrofit kits are compatible with PowerInsight. Most legacy products are not compatible, but please contact your sales representative for additional details.

PowerInsight by Advanced Energy™

Designed for manufacturers looking to streamline troubleshooting, minimize downtime, and optimize operational costs.

- **Plug-and-play deployment** with total power system monitoring and in-depth diagnostics.
- **Complementary data insights**, including oscilloscope-level FastDAQ™ event captures, time-stamped full history of faults and warnings, unit statistics, and unit internal sensor data.
- **Web-based data visualization** with access to months of historical data, plus configurable raw data export and backup options.
- **Independent operations** on dedicated hardware -- no software installation required on customer system and no risk of interfering with existing monitoring and control systems.
- **Optional remote access** and configurable notifications within the customer's internal secured network.
- **Scalable infrastructure** designed to support future predictive maintenance capabilities.



Retrofit Options

Remote Plasma Source

MAXstream™

With flow capabilities of 3 to 12 standard liters per minute (SLPM) and industry-leading power control, the MAXstream™ product line provides a next-generation solution for chamber clean.

- Reliable, trouble-free operation
- Proprietary high-purity aluminum substrate with Type 3 anodization for longer chamber life
- Unique dual-ignition core design for near-100% ignition reliability
- Remarkable power control for consistent, repeatable performance



GenCal Sensor Retrofit

TEGAM 5540A Series RF Power Meter

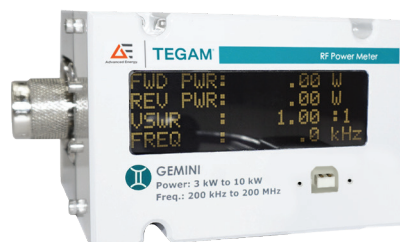
- Modern functionality, easy-to-use design, and flexibility
- Readings simultaneously displayed on a large OLED display
- Sensor and meter in one convenient instrument
- Direct measurement or via a connected PC
- 2-sigma accuracy across power range at calibrated frequencies
- Wide frequency and power bands with fewer instruments
- Comes calibrated with three frequency levels. More options available at added cost
- Retrofit solution for GenCal



GenCal PMH
(400/2200)



GenCal CEP



TEGAM 5540A Series

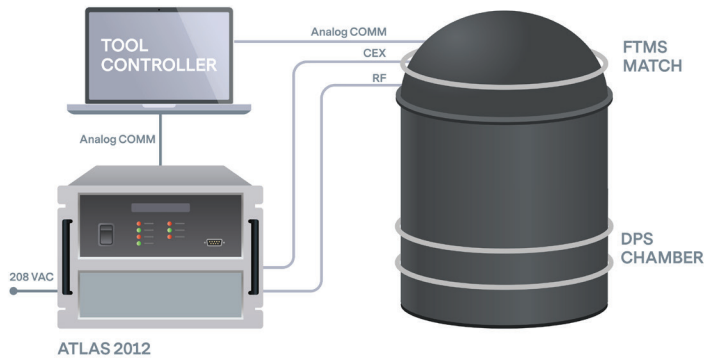
Generator-Match Retrofit

Atlas-FTMS to Paramount 2012-Navigator II

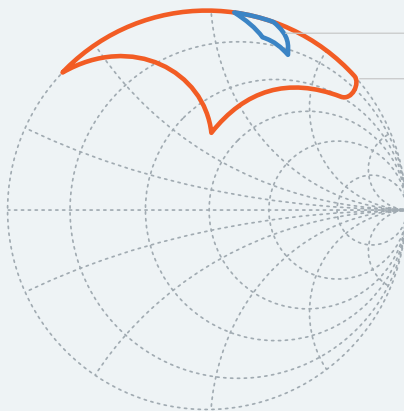
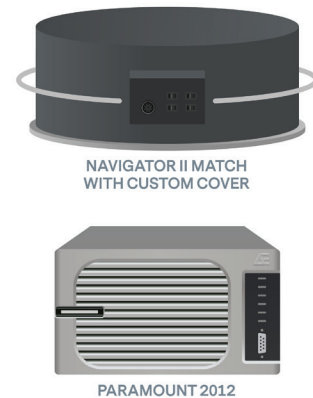
Paramount 2012 and Navigator II custom solution replaces the Atlas and FTMS directly on the chamber.

- Newer technologies provide increased quality → Higher uptime and lower maintenance costs
- Extension of RF delivery system lifetimes → Lower equipment cost

Generator-Match Retrofit Atlas-FTMS



Paramount 2012 Navigator II



FTMS

Navigator II

- Dual-level pulsing and frequency tuning features on the Paramount provide flexibility for ignition and process transparency
- Wider tuning range on the Navigator II
- Multiple preset options, delay settings and frequency tracking features on the Navigator II

Integrated Systems: Power Rack

FEATURES

- Higher performance RF generators with improved efficiency
 - >75% efficient at full power
- Touch Panel PC enabled with PowerInsight for data collection & visualization providing critical readbacks from all generators on one display and access to historical data
 - Remote access available for real-time assessment of tool performance and health
- Safety features including smoke and leak detection, and emergency off switch
- Rack is customizable for specific customer application and power requirements



PICTURED POWER RACK INCLUDES:

Paramount+ 5002:
2MHz 5kW (Qty 2)

Paramount 6013:
13 MHz 5kW (Qty 1)



INTEGRATED SYSTEMS : OMNI™

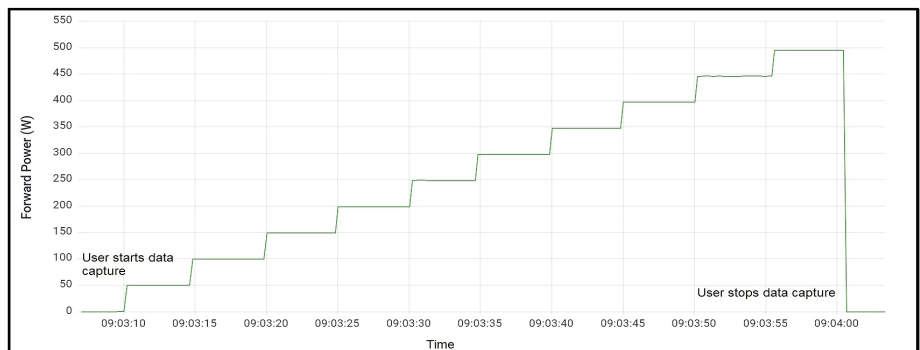
Omni, a modular and mobile diagnostic solution is integrated with a TEGAM 5540A RF power meter and PowerInsight by Advanced Energy™. It enables wafer fabs to optimize RF power delivery for critical processes and reduce equipment downtime and operational costs.

FEATURES

- TEGAM 5540A RF power meter
 - Wide frequency band 0.2 to 200 MHz; Power: 3 to 5000 W
 - Accuracy: $(2\sigma) \pm 0.5\% + 0.5 \text{ W}$, at calibrated frequencies across the full power range
 - Calibrated with 6 frequencies on a single device
 - Options for different RF Adapters
- Touchscreen display or PC network access for local and remote usage
- Detachable 10 kW, 50 ohm, oil-cooled load for inline RF measurement checks
- Accommodations for 100 to 240 VAC input
- PowerInsight data collection features help fabs track trends.
 - Metadata tagging for traceability
 - Manual and automatic measurement modes and options to export in .csv
 - Historical data storage for predictive analytics and troubleshooting
 - Advanced features available, such as custom data collection, custom dashboard views, and alerts to aid in faster diagnostics



Dimensions (H x W x L):
35.6" x 18.2" x 48"



POWERINSIGHT
by Advanced Energy™

GEM2

AUTOMATIC ☐ MANUAL ☒ Logout Settings Sleep Shutdown

	A	B	C	D	E	F	G	H	I	J
1	Power Setpoint (watt)	Duration (seconds)	Measured (watt)	Calculated Offset						
2	90	5	99.47	9.47						
3	140	5	149.09	9.09						
4	190	5	198.9	8.9						
5	240	5	248.36	8.36						
6	290	5	297.79	7.79						
7	340	5	347.55	7.55						
8	390	5	396.85	6.85						
9	440	5	445.67	5.67						
10	490	5	494.97	4.97						
11	User Input		Measured	Calculated						
12	0		0	0						

Do you want to save the measurements? Cancel Save

4100T OPTICAL FIBER THERMOMETER (OFT)

OR2000 and OR4000 Retrofit Solution for RTP and CVD Applications

OR4000 Drop-in Replacement

- Dimensionally identical
- Copy Exact compatible with OR4000 installations
- OR2000 Matched Functionality
- Backwards compatible with existing optical fibers and sensor assemblies
- Configurable serial and analog communication

4100T Features & Benefits

- Touch screen display for on-site control
- 1 to 4 channel capability with read rates up to 1 kHz per channel
- RF/EMI immune temperature sensing
- Multiple wavelengths possible with one instrument
- RS-232/422, Ethernet, EtherCAT, and analog interfaces with trigger and sync capabilities included
- Highly flexible, module-based platform architecture

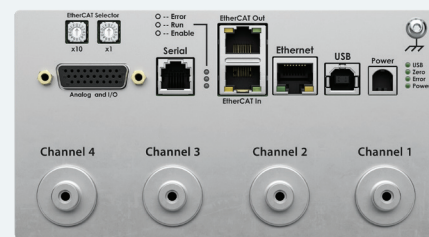
4100T

Front view



4100T

Rear view with four optical channels installed



LOFAT TO LFFM

Replace the now discontinued and hard to repair low frequency auto-tune (LoFAT) match with AE's low frequency fixed (LFFM) match

Features & Benefits

- LFFM provides substantial reliability improvements with reduced downtime
- No changes to chamber connections (RF input/output connectors)
- Same footprint as LoFAT match
- Process improvements with lower reflected power and faster plasma impedance matching
- Proven compatibility with OEM recipes and controls (transformer tap settings)



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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than four 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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