PRECISION OPTICAL TEMPERATURE MEASUREMENT & POWER CONTROL
PYROMETERS AND SCR POWER CONTROLLERS FOR TEMPERATURE-CRITICAL ENVIRONMENTS
Constant and Precise Control

Precision optical temperature measurement and SCR power control for a wide variety of manufacturing processes.
Temperature Measurement and Control for Advanced Thermal Processes

Advanced Energy® (AE) optical temperature measurement pyrometers and SCR power controllers enable constant and precise control of your demanding temperature-critical thermal processes. AE’s temperature measurement and power control devices are used around the world in a wide variety of thermal and heat treatment processes. Typical applications include glass and plastics forming, steel forging, casting and extrusion of non-ferrous metals, and carbon fiber production and annealing, to name a few.

Thyro-Family SCR Power Controllers

No other SCR power controller series offers the flexibility and performance of Advanced Energy’s Thyro-Family line. Our solutions meet your toughest design challenges. Thyro-Family SCR power controllers have a 50-year history, providing proven precision and reliability for any industrial manufacturing process requiring exacting material melting, heating, drying, or forming.

Onyx™ Line of Optical Temperature Pyrometers

AE utilizes industry-leading, proprietary calibration methodologies to enable precise pyrometer temperature measurement in the harshest environments. Onyx single-and-multi-channel pyrometers provide extreme accuracy even for moving or inaccessible work pieces, or when direct physical contact would interfere with the manufacturing process or damage the final work product.

Real-Time Equipment Monitoring

AE’s software works in concert with our SCR power controller series and single-and-multi-channel pyrometers. Thyro-Touch and PyroConnect™ assist with setup and commissioning and enable in-situ data logging, data collection, and data analysis. Their modular architecture allows for interaction with one or many devices for real-time equipment monitoring, logging, and trending.
Setting the standard for SCR power controllers, Advanced Energy's Thyro-Family of SCR power controllers ensure high product quality and reproducibility with a wide range of supported operating voltages, multiple operating control modes, and superior interface options for the most demanding thermal applications. AE SCR power controllers can help reduce downtime through predictive analytics, improve energy consumption, and boost product quality. Features and benefits of the Thyro product line include:

- A compact footprint with DIN rail mountable design for space savings and simplified installation
- Precise regulation of power, including load management for optimal control and energy consumption
- Customizable faults, alarms, status, limits, and set points for easy integration to existing control systems
- Optimized load control with five control types and three operating modes for process efficiency
- 1, 2, and 3-Phase units, and supporting loads of up to 2900 A

Recommended applications for the Thyro-family are many. Some of the more common applications include:

- Automotive (paint drying equipment)
- Extruders and plastic processes
- Chemical (pipe trace heaters, pre-heating equipment)
- Furnaces (industrial, diffusion, drying ovens)
- Glass (float, feeders, finishing equipment)
Thyro-PX® Series

Setting the standard for SCR power controllers, the Thyro-PX is our most advanced high-performance SCR power controller with a wide range of supported operating voltages, multiple operating modes, and advanced interface options for the most demanding thermal applications. Thyro-PX supports loads up to 2900 A with an operating resolution of ±0.5%. The Thyro-PX features:

- Large 71.1 mm (2.8 in) LED graphic display with integrated process data recorder and SD card
- Suite of digital and analog I/O options, including optional fieldbus communications
- Integrated memory for error tracking and energy consumption analysis
- Mains load optimization with dynamic digital control and power monitoring
- Rated currents up to 2900 A and voltages to 690 V

Thyro-AX® Series

The Thyro-AX is AE’s superior digital thyristor SCR power controller with a wide range of supported operating voltages, enhanced control modes, and added interface features for more demanding applications. The Thyro-A supports loads up to 1500 A and operating resolution of ±1.5%. The Thyro-AX features:

- Full-graphic LED touch display for intuitive control and process monitoring
- Multiple operating modes with optional mains load optimization feature
- Fully digital communications with optional fieldbus communication options
- Rated currents up to 1500 A and voltages to 600 V
PYROMETERS AND SCR POWER CONTROLLERS

**Thyro-A® Series**

Striking the perfect balance between price and performance, the Thyro-A is an outstanding value with flexible application capabilities, industry-proven reliability, and is ideally suited for a wide variety of general heating applications. A flexible digital thyristor SCR power controller, the Thyro-A supports loads up to 1500 A and operating resolution of ±3%. The Thyro-A features:

- Compact footprint with wide range of operating voltages and current ranges
- Multiple operating modes with optional mains load optimization feature
- Fully digital communications with optional fieldbus communication options
- Rated currents up to 1500 A and voltages to 600 V

**Thyro-S® Thyristor Switch**

Efficient yet powerful, the Thyro-S is AE’s smallest-footprint digital thyristor switch that provides a comprehensive set of installation options and advanced functions. The Thyro-S is ideal for general heating applications and supports loads up to 350 A. The Thyro-S features:

- Compact footprint with wide range of operating voltages and current ranges
- Load monitoring, alarm relays, and power measurement
- Analog and digital communications with optional fieldbus communication options
- Rated currents up to 1500 A and voltages to 600 V
Onyx Series of Optical Temperature Pyrometers

Focusing on the most demanding industrial applications, Advanced Energy’s Onyx series of optical temperature pyrometers have been specifically developed to provide repeatable temperature measurement even in harsh environmental or changing emissivity conditions. Choose from single or multi-point measurement options, wavelengths targeted for the application, and active-emissivity options.

The application possibilities the Onyx series of optical temperature pyrometers are many, and some of the most common ones include:

- Quartz and sapphire — growth and annealing
- Steel — forging, finishing, and vessel monitoring
- Thin-film solar — glass, metals
- Non-ferrous metals — casting, forging, and extrusion
- Carbon fiber — production and annealing
- Technical ceramics — heat-treatment, sintering

Onyx Series Single-Channel Versions: Onyx-S and Onyx-S2C

The Onyx-S and Onyx-S2C provide single-and-two-color ratio measurement options, respectively. With fieldbus communication options and integrated laser alignment, precise temperature measurement is achieved even under high ambient operating temperatures.

Onyx-S

Advanced Energy’s most versatile optical temperature pyrometer, the Onyx-S is a single-channel, single-wavelength, non-contact infrared optical temperature pyrometer with a 700 to 1550 nm configurable wavelength range. Features include:

- Configurable wavelength based on material type, with broad temperature range
- IP65 industrial protection for harsh environmental conditions
- Both analog and digital communications with optional fieldbus protocols for closed-loop control
Onyx-S2C

Ideal for changing environmental conditions or view path interference, the Onyx-S2C is two-color, non-contact infrared optical temperature pyrometer utilizing two-color ratio measurement for precise temperature measurement. Features include:

- Precise temperature measurement, even in harsh environment conditions enabling closed-loop process control
- Two-color ratio measurement for changing emissivity or view path obstruction conditions
- IP65 industrial protection for harsh environmental conditions
- Both analog and digital communications with optional fieldbus protocols for closed loop control

Onyx Series Multi-Channel Versions: Onyx-MC and Onyx-MCE

The Onyx-MC multi-channel optical temperature pyrometer, and the Onyx-MCE multi-channel with active emissivity compensation, enable configurable wavelengths based on the material being measured, and perform across a broad temperature range.

Onyx-MC

The Onyx-MC is a versatile multi-channel, optical temperature pyrometer with 700 to 1550 nm range configurable wavelength range using fixed-emissivity correction. Features include:

- Configurable wavelength based on material type with broad temperature range
- Multi-channel measurement capabilities using remote optical sensors and fiber optic cables
- Both analog and digital communications with optional fieldbus protocols for closed-loop control
Onyx-MCE

Our most advanced optical temperature pyrometer, the Onyx-MCE employs a separate source for real-time reflectance measurement and active emissivity compensation. Features include:

- Active-emissivity measurement and compensation for materials with changing emissivity during processing
- Configurable wavelength based on material type with broad temperature range
- Multi-channel measurement capabilities using remote optical sensors and fiber optic cables
- Both analog and digital communications with optional fieldbus protocols for closed-loop control

Rockwell Automation Encompass Partner

AE Onyx series optical temperature pyrometers and Thyro-family SCR power controllers include Rockwell Automation Add-On Profiles (AOPs) for quick and easy installation to Rockwell automation systems. AOPs are custom software wizards that allow quick and easy configuration of third-party devices to communicate with Rockwell Automation control systems.

Advanced Energy worked closely with Rockwell Automation to develop AOPs for the Onyx-S and Onyx-S2C, with custom features that enable our customers to quickly integrate optical temperature pyrometers into their new and existing thermal processes.

AE has been an Encompass Partner with Rockwell Automation since 2014, and both product lines are an integral part of implementing closed-loop control for critical thermal processes in a wide range of industrial markets.
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.

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. NOT RESPONSIBLE FOR ERRORS OR OMISSIONS. ©2018 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy®, AE®, Thyro-PX®, Thyro-AX®, Thyro-A®, and Thyro-S® are U.S. trademarks of Advanced Energy Industries, Inc. Rockwell Automation is a registered trademark of Rockwell Automation.