✦ LumaSense®
TECHNOLOGIES

LumaSMART

Fluoroptic-Based Winding Hot Spot Temperature Sensor for Generation, Transmission and Distribution Transformers

LumaSMART is the fifth generation Fluoroptic®-based thermometry system from LumaSense. By providing direct and real-time winding hotspot measurements, utilities can:

- Implement Dynamic Loading
- Extend the Life of Transformers
- Reduce Costly Failures
- Maximize Safe Performance

Exceptional Reliability and Accuracy in Winding Hot Spots Temperature Monitoring

LumaSense Technologies' LumaSMART winding hot spot temperature system is the most advanced and reliable real-time monitoring solution available today. LumaSense is the leader in Fluoroptic® (FOT) Technology, with decades of proven expertise. The LumaSMART FOT hot spot monitoring systems provide accurate, real-time temperature readings for protection and control of your critical power transformer assets.

LumaSense's PFA teflon-jacketed Fluoroptic probes are considered the standard in the industry. **Featuring five-layer protection in their fiber optic encapsulation for 99% installation success**, they are specially designed to withstand harsh environments without deteriorating physically or affecting the accuracy of the temperature measurement.
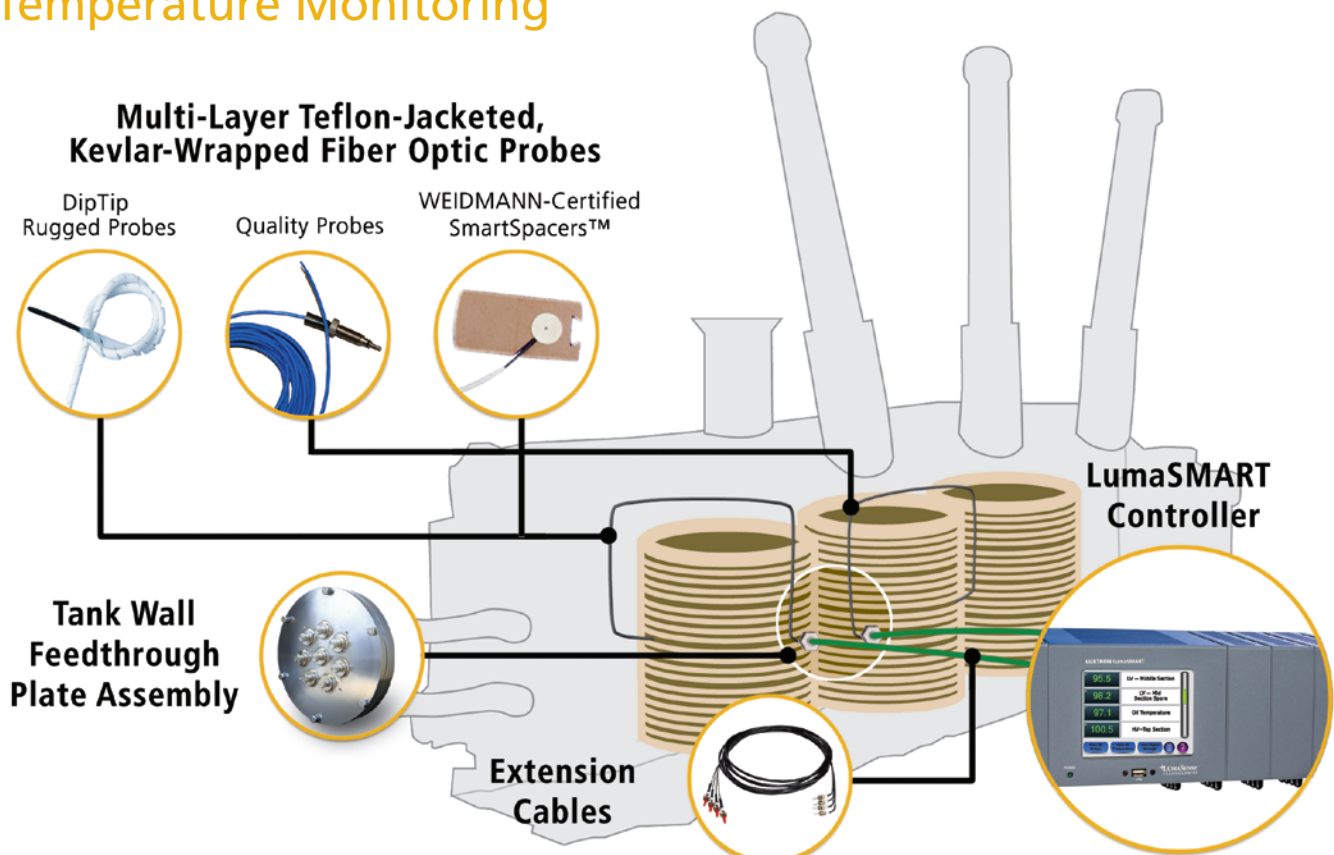
LumaSense Technologies' LUXTRON brand is the world leader in fiber optic temperature measurement in transformers. With more than 30 years of fiber optic experi-ence, LumaSense continues to lead the way in innovation of new, robust technology.

Measuring Hot Spot Winding Temperature

Transformers often take the brunt of an overload condi-tion. **Monitoring the transformer winding hot spot is critical to safeguard your transformer from damage and extend its usage.** Transformer life is directly related to the life of the internal paper insulation. The insulating paper's life is directly affected by its exposure to high temperature. The highest temperature on the windings is the Winding Hot Spot, where the insulating paper will deteriorate first. Conventional methods simulate or calcu-late this temperature, but do not accurately measure it. The only true way of knowing the actual temperature is through real-time fiber optic measurement. Our reliable, accurate monitors quickly detect and respond to hot spot conditions, triggering alarms and relays to protect your most valuable assets.

Smart Grid Power Transformer Hot Spots Temperature Monitoring

Multi-Layer Teflon-Jacketed, Kevlar-Wrapped Fiber Optic Probes

DipTip Rugged Probes

Quality Probes

WEIDMANN-Certified SmartSpacers™

Tank Wall Feedthrough Plate Assembly

Extension Cables

LumaSMART Controller

The Multi-Channel Controller System Should Include:

- LumaSMART Multi-Channel Smart Controller

- Fluoroptic Probes
  - Quality Probes
  - DipTip Rugged Probes

- Extension Cables
  - Single Fiber Extension
  - Four-Fiber Extension

- Tank Wall Feedthrough Plate Assembly
  - Stainless Steel Bolted Plate
  - Individual Tank Wall Feedthroughs

- Optional Accessories
  - NEMA 4 Enclosure
  - WEIDMANN-Certified SmartSacers™
  - NEMA 12 Tank Wall Cover Box
  - Internal and External Plug Assemblies
  - LUXTRON 812 Handheld Unit

The LumaSMART Controller

LumaSense Technologies' LumaSMART controller is the newest innovation from the leader in FOT technology. Building on the proven performance of the ThermAsset2, this monitor provides all of the capabilities of its predecessor while adding smart grid capabilities, an innovative touch screen and extended channel and relay capabilities.

- Easily adaptable to user-specific needs with 4 to 16 channels and 0, 8 or 16 Form-C programmable relays

- ±2°C accuracy over the entire temperature range for the life of transformer with no calibration

- No drift, no calibration required

- Analog outputs and Modbus, DNP3, ASCII and IEC61850 communication capability standard

- RS-232C and RS-485, Ethernet and USB serial outputs

- Light source lasts the life of the transformer

- Interactive touch screen display for alarms, notifications and set-up

- Equipped with 2GB standard data storage for transformer lifetime memory storage

- On-board diagnostics troubleshooting guidance

Fluoroptic Probes

The measurement performance of LUXTRON probes exceeds common temperature sensors in environments with high voltage, radio frequency interference (RFI), electromagnetic interference (EMI) or corrosive and above boiling point liquids. Our robust probes are designed for ease of installation and have a greater than 99% installation success rate.
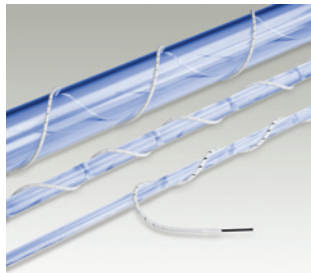
- Industry standard LUXTRON Quality Probes™ and DipTip Rugged Probes™

- Viton O-ring connector for protection against leaks

- PFA Teflon®-jacketed design with Kevlar® construction

- Immune to RF and EMI and Electrically Non-Conductive

- Most robust, well-built fiber optic probes on the market

- Insulated with five layers for superior protection

- DipTip Rugged Probes don't require double installations

- Dielectrically tested to ensure safe, accurage performance

- Chemically inert and compatible with many aggressive chemicals

- Intrinsically safe, stable and drift-free

- Available in various lengths (1m to 16m standard)

WEIDMANN-Certified SmartSpacers™

Our sensor tips can be supplied with WEIDMANN-certified SmartSpacers. All WEIDMANN-certified components including adhesives and assemblies meet strict manufacturing process controls and are shipped with a certificate of compliance outlining that the component has met the five-part WEIDMANN certification process. Available with LumaSense DipTip Rugged Probes™.

Extensions

LumaSense offers multiple fiber optic extensions options to connect the probes from the tank wall plate to the instrument.

Single Fiber Extension
- Hard Clad Silica fiber jacketed in PVC and Kevlar®

- Available in lengths of 5, 10, 15 or 20 meters or custom lengths by request up to 50 meters

- SMA connector includes Viton O-ring for protection against leaks

Four-Fiber Extension
- Four fiber cable subunits and a central Kevlar® strength member in one PVC outer jacket

- Each subunit features Hytrel® and Kevlar® over Hard Clad Silica fiber

- Available in lengths of 5, 10, 15 or 20 meters or custom lengths by request up to 50 meters

- Viton O-ring connectors for protection against leaks

- Available in low temperature construction also

Tank Wall Plate Assembly

LumaSense provides welded tank wall feedthrough plate assemblies. Each tank wall plate features our proprietary welded feedthroughs on a stainless steel plate, with a carbon steel backing ring and Viton O-ring for maximum protection against leaks.

Technical Data

Performance

Number of Channels	4 to 16 (in increments of 2)
Temperature Range	-30 to 230°C
Accuracy	±2°C over entire temperature range for life of transformer without calibration
Display Response Time	1 sec
Measurement Resolution	0.1°C
Precision	±0.5°C
Light Source Life Span	Life of the transformer
EMI/RFI Susceptibility	Complete immunity

Interface

Display	5.7-inch interactive touch screen
Probe Signal Strength Readout	Accessible for all channels
Diagnostics	On-board self diagnostics and troubleshooting guide

Environmental Specifications

Operating Temperature	-30 to 70°C
Storage Temperature	-35 to 75°C

Communication

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Analog Output	Choice of 4-20mA or 0-1mA
Serial Output	RS-232C and RS-485, Ethernet, USB
Relays	0, 8 or 16 Form-C programmable relays
System Status Relay	1 Form-C relay
Communications	Modbus ASCII, Modbus RTU, DNP3.0, ASCII and IEC61850 Standard
Probes	Accepts LUXTRON Rugged and Quality Probes
Data Storage	2 GB of data at 1 minute intervals on all channels, as well as error codes and relay statuses. Retains approximately 40 years of data.

Electrical

Input Power	90 to 264 VAC or 127 to 370 VDC, 47 to 63 Hz
Surge Protection	4000V (IEEE C37.90.1-2002)
Consumption	108 W (maximum)

Physical

Mounting	Rack, panel or wall mount available

Innovative On-Board Software

The LumaSMART's innovative on-board software gives a color-coded visual display of all connected probes. Using the touch screen exclusively offered by LumaSense, you can customize channel labels, configure alarms and relays and download data logs. In addition, the diagnostic feature allows you to easily test your configured relay settings by simulating alarm conditions. Our software also allows for trending and data analysis of temperatures measured.

LumaSense Technologies

Awakening Your 6th Sense
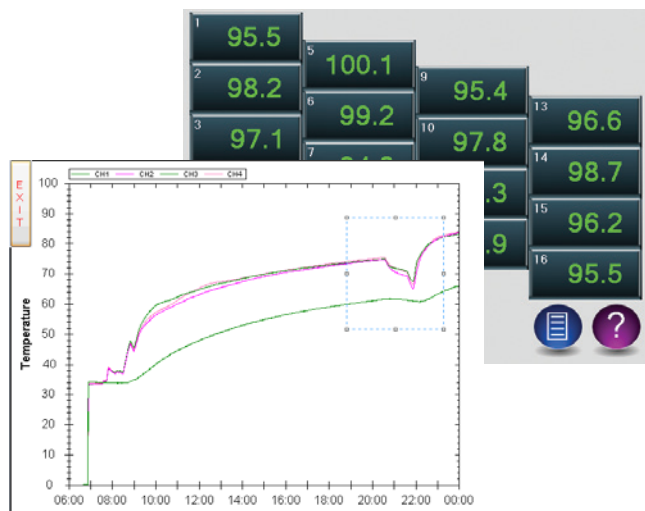
Americas and Australia
Sales & Service
Santa Clara, CA
Ph: +1 800 631 0176
Fax: +1 408 727 1677

Europe, Middle East, Africa
Sales & Service
Frankfurt, Germany
Ph: +49 69 97373 0
Fax: +49 69 97373 167

India
Sales & Support Center
Mumbai, India
Ph: +91 22 67419203
Fax: +91 22 67419201

China
Sales & Support Center
Shanghai, China
Ph: +86 133 1182 7766
Fax: +86 21 5877 2383

info@lumasenseinc.com

www.lumasenseinc.com