

Advanced Heat Trace Management and Monitoring

OVERVIEW



SmartTrace is an industrial-grade monitoring and management solution specifically designed for electrical heat trace systems. As an all-in-one platform, SmartTrace offers real-time visibility, predictive maintenance, and comprehensive management capabilities that transform how facilities monitor and maintain their heat trace infrastructure.

WHAT SMARTTRACE DOES

SmartTrace integrates seamlessly with your existing heat trace systems, providing a secure, scalable solution that enhances operational efficiency. Whether monitoring systems from a centralized control room or on-the-go from a mobile device, SmartTrace delivers the insights you need to prevent operational issues, reduce maintenance costs, and optimize system performance.

VALUE TO END USERS

- ✓ **Enhanced Operational Efficiency:** Automate monitoring, alarming, and management of your heat trace circuits, ensuring continuous uptime.
- ✓ **Risk Mitigation:** Identify and address potential issues before they lead to costly failures.
- ✓ **Energy Savings:** Monitor power usage trends and optimize energy consumption.
- ✓ **Flexible Deployment:** Choose between cloud, on-premise, or hybrid solutions tailored to your facility's specific needs.
- ✓ **Security Focused:** With SmartTrace Marshal, your data is safeguarded by patented, industry-leading security measures.

SmartTrace Standard Industrial Cloud Implementation

Specifications

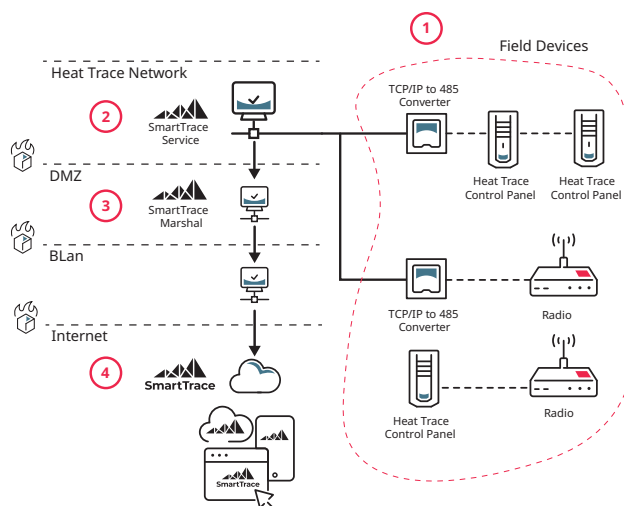
SmartTrace utilizes a cloud-based architecture that combines accessibility, flexibility, and security. Below is a detailed breakdown of how SmartTrace operates and the measures in place to protect your sensitive information:

1. HEAT TRACE EQUIPMENT

- **Integration:** Connected to a dedicated LAN or VLAN within the facility's network, heat trace equipment forms the core of the SmartTrace ecosystem.
 - **Wireless Integration Option:** With our advanced wireless communication solutions, SmartTrace can connect to remote or non-networked heat trace controllers, eliminating the need for extensive wiring. This solution is ideal for large-scale facilities or areas where traditional network cabling is not feasible.

2. SMARTTRACE SERVICE APPLICATION

- **Installation:** Installed on a Windows or virtual machine within the Process Control Network (PCN).
- **Functionality:** Communicates with heat trace controllers via Modbus for real-time monitoring. Initiates outbound communications only, preventing direct external access to facility hardware.



3. SMARTTRACE MARSHAL APPLICATION

- **Secure Data Transfer:** Patented technology securely passes information through a facility's network environments, ensuring data integrity and security.

4. SMARTTRACE CLOUD SERVERS

- **Central Hub:** Serve as the central hub for data processing and analysis. Communication between the SmartTrace Service application and cloud servers is encrypted using Transport Layer Security (TLS).

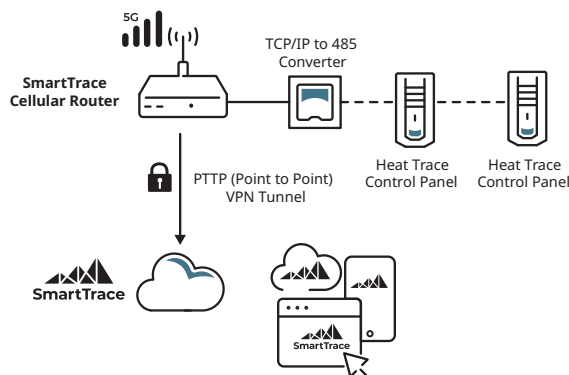
Security Measures

SmartTrace is built with a multi-layered security approach to protect your facility's data and operations:

- **End-to-End Encryption:** All communications are encrypted using TLS, ensuring data confidentiality and protection from unauthorized access.
- **Outbound Communication:** The SmartTrace Service initiates outbound communications only, reducing security vulnerabilities.
- **Access Controls:**
 - Two-Factor Authentication (2FA): Adds an additional layer of security for user access.
 - Strong Password Security: Enforces strong passwords with mandatory periodic changes.
 - Single Sign-On (SSO): Supports Microsoft Azure SSO for secure user authentication.
 - Granular Access Control Lists (ACLs): Allows administrators to assign different access levels based on user roles.
- **Firewall and Network Security:**
 - Firewall Settings: Configured to reject all ingress traffic except responses to requests initiated internally.
 - No Open Ports: No active ports listen for incoming requests, reducing entry points for unauthorized access.
 - Multi-Layer Network Support: The SmartTrace Marshal ensures secure and efficient communication between network layers.

Cellular Connection

Designed specifically for smaller facilities or remote locations, this deployment option connects your heat trace controllers directly to the SmartTrace cloud servers via a cellular connection. This option is perfect when traditional network infrastructures are either unavailable or not cost-effective.



Implementation

- **Cloud Connectivity:** The SmartTrace Cloud handles all polling of hardware devices directly through the established cellular connection, ensuring real-time monitoring and data collection.
- **Security:** To ensure the integrity and confidentiality of your data, we establish a secure VPN tunnel between the cellular routers and SmartTrace's cloud infrastructure. This encrypted connection provides robust protection against unauthorized access.
- **Hardware Requirements:** This configuration involves the deployment of our high performance cellular router, alongside communication protocol converters that facilitate seamless data transmission from heat trace controllers to SmartTrace's cloud servers.
- **Use Case:** Ideal for remote facilities, smaller installations, or locations where establishing traditional network infrastructure would be prohibitively expensive.

LEARN MORE

To explore which SmartTrace implementation is right for your facility, contact us at SmartTrace@chemex.com to schedule a consultation with our development team.

Custom On-Premise SmartTrace Solutions

Deployment Configurations

ON-PREMISE ONLY

- **Description:** SmartTrace is deployed within the customer's local network, with system data hosted on-site and not transmitted externally.
- **Infrastructure Requirements:** Customer-provided server infrastructure is required. Server specifications and deployment requirements will be provided by Chemelex upon request.

HYBRID CLOUD/ON-PREMISE

- **Description:** In this setup, users access SmartTrace via the cloud with read-only access, while read-write access is enabled when connected to the local network server.
- **Implementation:** Custom API connections and TLS certificates provide secure and seamless integration between cloud and on-premise systems.
- **Security:** The client's network is configured to block all incoming write requests from the cloud, ensuring data integrity and secure local control.

On-Premise Software Considerations

- **Deployment Model:** SmartTrace is installed within the customer's local IT environment and operates entirely on customer-provided infrastructure.
- **System Updates:** Chemelex provides quarterly software updates to maintain compatibility, security, and system performance.
- **Infrastructure Coordination:** Server and infrastructure requirements must be reviewed and confirmed with Chemelex prior to deployment.

INTERESTED IN LEARNING MORE?

For pricing details and further information on how a custom server can benefit your facility, please reach out to us at SmartTrace@chemelex.com.

SmartTrace: Tiers and Options

Feature	Description	SmartTrace Monitoring	SmartTrace Management	SmartTrace Enterprise
User Account	Unlimited individual secure user accounts with unique permissions	✓	✓	✓
Secure Login & Authentication	2FA and optional facility Microsoft Single Sign-On (SSO)	✓	✓	✓
Live Circuit Monitoring & Configuration	Monitor and configure circuits in real-time	✓	✓	✓
Live and Interactive Dashboard	Understand the health of your EHT system. Know where to focus your efforts	Limited	✓	✓
Automatic Continuous Device Trending	Continuous device trending for all circuits. Know what's happening in real-time		✓	✓
Automated Notifications	Rule-based notifications that automatically alert users via email, text message, or phone call based on defined system events and conditions		Optional	Optional
Document Control Center	Store and access all your heat trace-related documents		✓	✓
Alarm Historian	Historical data for all alarms to help identify recurring issues	✓	✓	✓
Communication Loop Monitoring	Monitor the health and performance of your communication network		✓	✓
Process and Electrical Circuit Data Integration	Integrate process and electrical data for comprehensive monitoring		We Import	We Import
Power Trending	Continuous power trending and analytics to identify usage patterns, inefficiencies, and wasted energy consumption		✓	✓
Alarm Validation	Prioritize alarms and filter out non-critical alerts		✓	✓
Criticality Rulesets	Apply advanced priority rules to focus on operationally critical lines		✓	✓
Digital Field Testing Reports	Digitize and store all field testing reports, including splice repair forms, for easy access and analysis		✓	✓
Geo Tagging	Tag & find heat trace panels and circuits directly with your smartphone		✓	✓
Replace Controller Feature	Replace & upgrade controllers without losing valuable data or requiring reprogramming		✓	✓
Mass Program Configurator	Make mass programming changes across multiple controllers efficiently		✓	✓
Programming Audits	Automatic programming audits to make sure the system is operating as per design - catch issues before they happen		✓	✓

Feature	Description	SmartTrace Monitoring	SmartTrace Management	SmartTrace Enterprise
Heat Trace Reporting Emails	Receive automated reports on the status of your heat trace system		✓	✓
Scheduling Data	Integrate scheduling data for effective maintenance planning		✓	✓
Scheduling System Integration	Sync with SAP, Maximo, and other systems for seamless work order management		Optional	✓
Scheduling Data Historian	Track and analyze past scheduling data to improve future planning		✓	✓
Forced On EHT Manager	Manage your forced on circuits to tune your system and correct problematic circuits		✓	✓
Nuisance EHT Manager	Filter out nuisance alarms to reduce unnecessary maintenance actions		✓	✓
Freeze Log Manager	Track incidents of freeze events and their resolutions	✓	✓	✓
Multiple Facility Manager	Manage heat trace systems across multiple facilities		✓	✓
User Audit Trail	Tracks and records user actions and configuration changes across SmartTrace, including changes made directly at physical devices outside the SmartTrace platform, providing traceability and accountability		✓	✓
Work Order Generation	Our team generates heat trace work orders directly in your scheduling system			✓
24/7 Remote Force On/Off Support	Immediate remote support for critical actions			✓
24/7 Technical Support	Round-the-clock technical support from our experts			✓
Field Labour Support	A part-time field asset to supplement your maintenance team with heat trace assessments, troubleshooting and repair services	Optional	Optional	Optional

SmartTrace: Comparison Chart

Feature	Description	SmartTrace	Market Player/Other
User Account	Unlimited individual secure user accounts with unique permissions	✓	✓
Secure Login & Authentication	2 factor authentication and optional facility authentication integration	✓	
Mobile Device Access	View and control your heat tracing in the field from your phone or tablet	✓	
Live and Interactive Dashboard	Understand the health of your EHT system. Know your system to protect your assets	✓	
Automatic Continuous Device Trending	Continuous device trending for all circuits. Keep your data forever.	✓	Hard drive limitation
Power Trending	Continuous power trending and analytics to reduce power consumption	✓	
Calculated Wasted Power Usage	Calculate wasted power usage of your heat trace circuits	✓	
Live Programming Audits	Automatic programming audits to make sure the system is operating as per design - catch issues before they happen	✓	
User Audit Trail	Clear and concise audit trail of every programming or configuration change on every heat trace controller. See what and who made configurations to the heat trace system.	✓	
Live Current and Temperature Monitoring From the Alarm Page	View live and temperature and current values in the alarm list page	✓	Static value when the alarm was generated
Advanced Search Capabilities	Advanced search capabilities. Search process line data or description to find the associated heat trace circuits.	✓	
Weather Forecast	Forecast data on your dashboard	✓	
Document Control Center	Built-in document control center to store PDF copies of heat trace isometrics, P&ID's, panel schedules, etc. OR linked with an existing document control center.	Multiple files and integration to existing document control center	Manual upload. File Limitation.
Alarm Validation	Automatically validate your alarms eliminating nuisance and troublesome alarms	✓	
Live Circuit Monitoring & Configuration	Monitor and configure individual heat trace circuits live from any device	✓	✓
SAP or Maximo Integration	Integration to ERP system to manage scheduling, alarm tickets and repairs	✓	
Criticality Rulesets	Not all alarms are created equally, utilize all your process, alarm and temperature data to create rulesets to prioritize alarms the right way	✓	
Alarm Historian	Track your alarm history to provide quick access to diagnostics and problem identification	✓	✓

Feature	Description	SmartTrace	Market Player/Other
Scheduling Data Historian	Real time historian of all heat trace related activities at your fingertips on the circuit viewer page	✓	
Communication Loop Monitoring	Detailed monitoring of the status and alarms specifically related to heat trace communication loops	✓	
Forced On EHT Manager	Manage your forced on circuits to tune your system and correct problematic circuits	✓	
Nuisance EHT Manager	Manage your nuisance alarms and address design and installation issues	✓	
Freeze Log Manager	Manage problematic heat trace circuits by identifying freezing issues and address the design and installation	✓	
Heat Trace Reporting Emails	Send scheduled reports on the health of the system at custom intervals that make sense for you	✓	
Circuit Manager Tools	Circuit information on mobile devices for maintenance teams to perform EI duties and troubleshooting	✓	
Multiple Facility Manager	Use one platform to manage EHT and EHT alarms at multiple facilities	✓	
Digital Field Testing Reports	Integrate field test reports directly into SmartTrace, enabling technicians to record and view completed tests across all HT circuits	✓	

**North America, Latin America,
Europe, Middle East, Africa, India**

SmartTrace@chemelex.com



Raychem Tracer Pyrotenax Nuheat