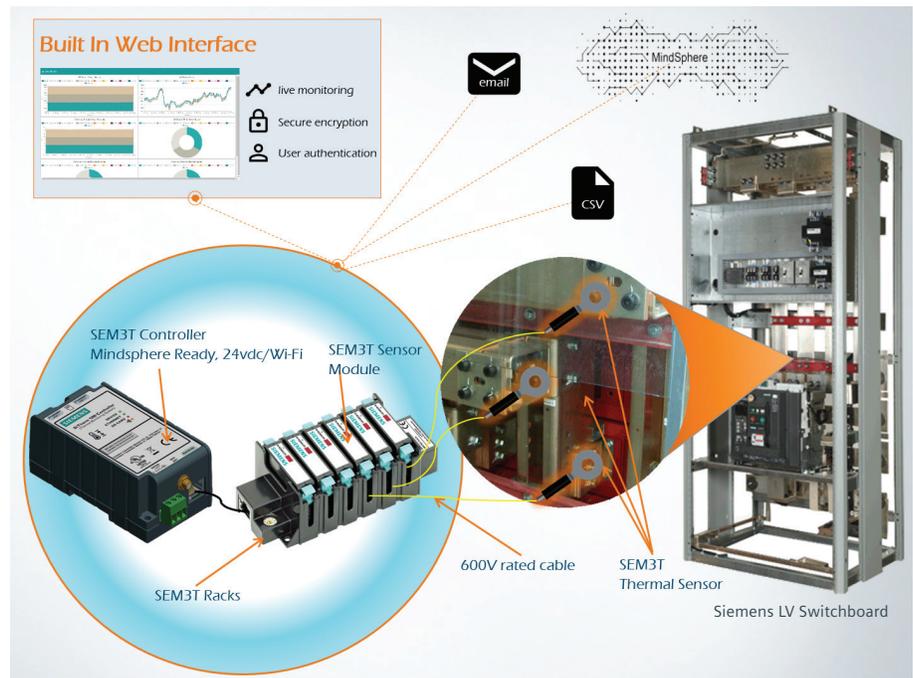


Coming soon!

# SEM3T™ – Thermal Monitoring System

Siemens Thermal Monitoring System (SEM3T) is a modular monitoring solution for thermal monitoring, realtime data, alarming notifications, historical logging/ trending, and reporting. The design of SEM3T, like that of SEM3, allows the user to select custom monitoring locations to efficiently and economically monitor temperature. SEM3T uses standardized components that can be easily integrated into Siemens Low Voltage Switchgear, Switchboards, Panelboards, and ATS systems to measure the temperature on key joints while withstanding harsh environments. SEM3T is pre-engineered to integrate into Siemens low voltage switchgear, power panels, and switchboard systems but is also offered for retrofit applications.

SEM3T, a reliable and easily installed thermal monitoring solution, can be integrated into existing applications such as, the lug landings, bus joints and outgoing load cables of panelboards, switchboards and switchgears . Additional applications include bus ducts, transformers, and circuit breakers. SEM3T Sensors can be positioned appropriately to detect temperature of potentially overloaded or poorly conducting electrical connections, and of ambient temperature to calculate heat rise. SEM3T



has the flexibility to be installed as a standalone thermal monitoring solution with real time data available from the built-in web interface. SEM3T sensors require no calibration. This system allows the user to select the areas to be monitored without excessive hardware, space, and possible system interference. SEM3T has a built-in industry standard

Modbus TCP communication and can be used for cloud monitoring through Siemens MindSphere platform. The SEM3T web pages can also be set by the user to any of four languages (English, German, French, or Spanish) for configurations and real-time data display.

## Applications



### Commercial

The SEM3T is a fully outfitted solution for commercial space electrical equipment monitoring. SEM3T can collect and trend thermal data to help you better monitor power connections and extend the lifecycle of electrical components while keeping all the data in one place. Due to the small footprint of SEM3T, integration is simplified by fitting into existing electrical equipment, leaving no need for additional space for monitoring equipment and more space for profits.



### Industrial

SEM3T offers a solution that is ideal for large or small facilities. Whether you are utilizing thermal monitoring to better target planned preventative maintenance or troubleshoot equipment outages for faster return to operations, SEM3T can accurately track and alert abnormal Thermal issues. With its competitively advantaged system, SEM3T is a new tool to help reduce maintenance costs with minimal onsite testing.

The SEM3T was designed with safety in mind. SEM3T can help you pinpoint problem areas and get early alerts from thermal issues. SEM3T provides a more robust thermal measurement system as compared to IR scans that can't scan obscured connections.

## User Advantages



### Contractors

The SEM3T thermal system provides an ideal electrical equipment monitoring system for contractors and installers. The installation of SEM3T when combined with other Siemens equipment is simple, saving time onsite. The device will come pre-installed with no separate enclosures to mount, simply add the temperature sensors to the areas of interest and attach the sensor depending on its configurations.



### Engineers and Consultants

The SEM3T application is compact and easily implemented into Siemens low voltage switchgear, switchboards, and powerpanels. With this thermal monitoring system added to your equipment, you receive live monitoring of your selected components with the reliable wired solution ready to withstand harsh plant environments. Installation is simple and calibration is not required.



### Insurance Companies

The SEM3T application is compact and easily implemented into Siemens low voltage switchgear, switchboards, and powerpanels. With this thermal monitoring system added to your equipment, you receive 24/7 live monitoring of your electrical equipment's with the reliable wired solution ready to withstand harsh plant environments.

## SEM3T VS. Infrared Thermography

For many years, scheduled infrared thermography inspections have been the accepted method for reducing risk of fire by identifying faulty or loose connections in electrical distribution systems. SEM3T is a system specifically designed to provide continuous thermal monitoring. It offers a safer, more effective way to detect thermal risks before they progress into a major failure. The method also delivers up to a 10:1 return on investment due to avoided equipment damage and downtime.

Continuous Thermal Monitoring is now enabling safer, more efficient inspection of energized electrical equipment, ensuring electrical asset integrity. This becomes apparent when looking at the technology comparison of SEM3T to IR windows and thermal imaging.

| SEM3T – Continuous 24/7 Thermal Monitoring   | IR Thermal Scanning  |
|--|--|
| Thermal hotspots and heat rise will not be missed by a SEM3T thermal monitoring system.  | IR thermal scanning might miss critical conditions if they occur between scheduled scans.          |
| SEM3T thermal monitoring systems will send dynamic alert notifications.  | No dynamic alerts. Manual operation.   |
| SEM3T will capture thermal events and will immediately send alarms to operations and maintenance teams, giving them time to respond before any equipment damage occurs.  | No software involved. Manual operation and interaction. Downtime could be severe with huge losses. |
| Energy management software can capture the current load and thermal points to compare the current load vs. thermal rises, This would give more accurate predictive analysis and trigger intelligent alarms to save downtime. | Only thermal points are scanned to through IR scans and no current load comparison.                |
| Historical logging trending allows user to compare thermal points against user selectable periods.   | IR data may be captured twice in a year or every quarter.  |
| Abnormal temperature rises can be detected quickly.  | Wait for inspector to scan the system to understand the abnormalities.                             |
| Not necessary to remove panel and covers. No need to de-energize critical electrical equipment.  | Panel and covers to be removed/replaced. Certified electrician may be required.                    |

Example – 4 section single ended LVS lineup (1 main and 12 feeders)

- 8 - IR view ports required (2 viewports per vertical section)
- \$1500/year IR scan service
- 51 x SEM3T sensors required (6 sensors for main breaker section and 15 sensors for each feeder breaker section)
- 4 x SEM3 Racks with cables
- 1 x SEM3T controller required

| Cost Comparison       | IR viewport solution | SEM3T 24/7 solution |
|-----------------------|----------------------|---------------------|
| Initial customer cost | \$3920               | \$7655              |
| Year 1                | \$1500               | \$0                 |
| Year 2                | \$1500               | \$0                 |
| Year 3                | \$1500               | \$0                 |
| Total Cost            | \$8420               | \$7655              |

### How does it work with Siemens Solution? What makes up SEM3T?

A compromised joint or connection can only be identified by the excess heat it generates. It is essential that excess heat is not confused with heat rise due to increased load or external environmental conditions. SEM3T system measure the Delta T (SEM3T system measures actual temperature of the joint).

SEM3T utilizes small non-powered sensors that are installed inside electrical equipment to continuously monitor the thermal condition of critical joints in energized electrical equipment. This enables permanent, non-invasive, 24/7 detection of hotspots at an early stage of development; thus, avoiding potential downtime resulting from Arc Flash / power outage incidents.

### Where do I typically install SEM3T in low voltage equipment?

Unlike IR Windows which are limited in where they can be placed and the view they provide, SEM3T provides a complete thermal monitoring solution for low voltage applications, that enables the following critical and key joints to be monitored simultaneously and in real-time:

- Low Voltage Switchgear Lug connections (Lug bolts to the lug pad)
- Critical vertical to horizontal bus bolted connections
- Per phase line side bus connections
- Critical cable connections

**SIEMENS Thermal Monitoring**

Settings Group **Realtime** Logging Dashboard User Configuration Tools About

All Modules  Select Group -- Select --

---

Total System Minimum (°C):  System Minimum Timestamp:  Reset

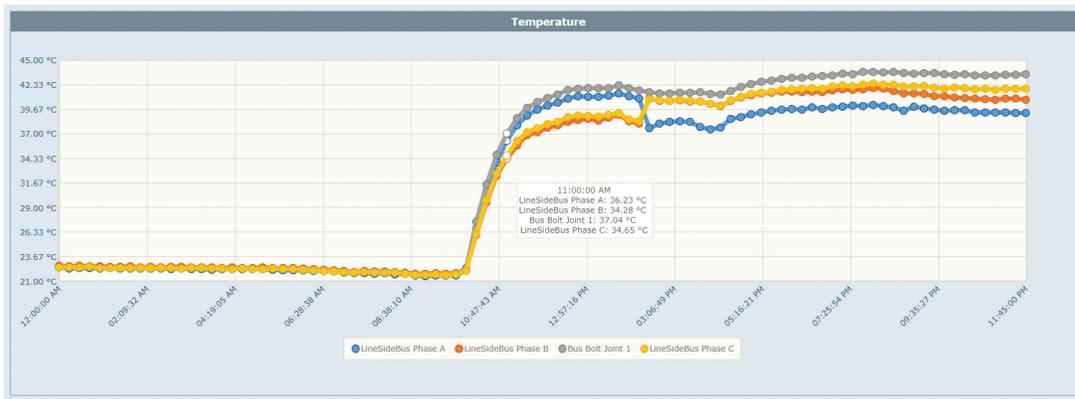
Total System Maximum (°C):  System Maximum Timestamp:

Total System Average (°C):

|   | Name                | Temp (°C) | Minimum    |                  | Maximum    |                  | Reset                    | Alarm                    |
|---|---------------------|-----------|------------|------------------|------------|------------------|--------------------------|--------------------------|
|   |                     |           | Value (°C) | Timestamp        | Value (°C) | Timestamp        |                          |                          |
| 1 | LineSideBus Phase A | 31.32     | 22.96      | 07-02-2019 08:43 | 94.63      | 07-02-2019 15:39 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 | LineSideBus Phase B | 27.11     | 24.28      | 07-02-2019 09:55 | 36.73      | 07-02-2019 15:40 | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 | LineSideBus Phase C | 25.35     | 23.21      | 07-02-2019 16:23 | 25.35      | 07-02-2019 16:29 | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 | Bus Bolt Joint 1    | 25.47     | 24.59      | 07-02-2019 16:25 | 25.47      | 07-02-2019 16:28 | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 |                     |           |            |                  |            |                  | <input type="checkbox"/> | <input type="checkbox"/> |

|    | Name | Temp (°C) | Minimum    |           | Maximum    |           | Reset                    | Alarm                    |
|----|------|-----------|------------|-----------|------------|-----------|--------------------------|--------------------------|
|    |      |           | Value (°C) | Timestamp | Value (°C) | Timestamp |                          |                          |
| 33 |      |           |            |           |            |           | <input type="checkbox"/> | <input type="checkbox"/> |
| 34 |      |           |            |           |            |           | <input type="checkbox"/> | <input type="checkbox"/> |
| 35 |      |           |            |           |            |           | <input type="checkbox"/> | <input type="checkbox"/> |
| 36 |      |           |            |           |            |           | <input type="checkbox"/> | <input type="checkbox"/> |
| 37 |      |           |            |           |            |           | <input type="checkbox"/> | <input type="checkbox"/> |
| 38 |      |           |            |           |            |           | <input type="checkbox"/> | <input type="checkbox"/> |
| 39 |      |           |            |           |            |           | <input type="checkbox"/> | <input type="checkbox"/> |
| 40 |      |           |            |           |            |           | <input type="checkbox"/> | <input type="checkbox"/> |

Realtime Temperature Monitoring



Temperature Trending



Maximum Temperature Trending

Published by  
Siemens 2020

Siemens Industry, Inc.  
3617 Parkway Ln  
Peachtree Corners, GA 30092

Siemens Technical Support:  
1-800-333-7421  
pds.techsupport.us@siemens.com

Subject to change without prior notice  
All rights reserved  
Order No. PDDS-SEM3T-0920  
Printed in USA-CP  
© 2020 Siemens Industry, Inc.

The technical data presented in this document is based on an actual case or on as-designed parameters, and therefore should not be relied upon for any specific application and does not constitute a performance guarantee for any projects. Actual results are dependent on variable conditions. Accordingly, Siemens does not make representations, warranties, or assurances as to the accuracy, currency or completeness of the content contained herein. If requested, we will provide specific technical data or specifications with respect to any customer's particular applications. Our company is constantly involved in engineering and development. For that reason, we reserve the right to modify, at any time, the technology and product specifications contained herein.