

New



# Biosirus

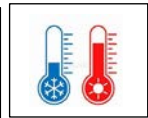
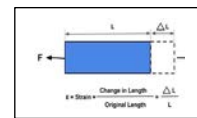
CTMS

## Cable Temperature Monitoring System

Continuous real-time digital thermal profile along cable

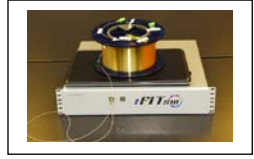
Up To Four Cables (4 Channels); Each Cable 10-20 km

Use optic-fiber in power cable or an external one (alongside)



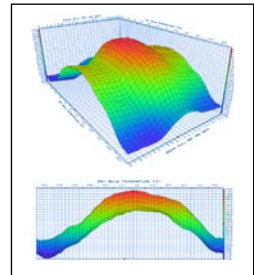
• **Application:**

- **HV/MV/LV Cables:** Utilities, Power Generation, Mines, O&G, Manufacturing, Aerospace, Defence
- **Cable Disposition:** Underground, Above-Ground, Marine, Ducts/Conduits/Direct Buried
- **Renewable Energy:** Cabling in large Solar/Wind farms and in hot climates
- **Asset Management:** Real-time Operations; Digital Twin; Remote Monitoring
- **Testing:** Laboratory/OEM, Prototyping, Factory Acceptance, Heat Run
- **Fire Safety:** Cabling in Mines, Power Plants, O&G, Aviation, T&D, Industrial, Other



• **Features:**

- Max. fiber length/channel (10-20 km loop)
- Temperature accuracy 0.5 deg C (±ΔT/T) over -50 deg C to +500 deg C range
- Strain accuracy 0.1% (±ΔL/L) in both tension/compression (useful for fault location)
- Measurement distance every 1 meter along fiber; Accuracy ± 1% per meter length
- Real-time data integration into SCADA/DMS/ADMS/BMS/Cloud/Other
- Multi-channel for logical and physical fiber separation
- Programmable zones and sampling rates (0.5 min. to >60 min); Min-Max & Ramp alerts



• **How Does It Work:**

- Optical/stimulated Brillouin scattering principle.
- Fiber embedded or external (for strain applications external fiber needs to be bonded)
- Entire fiber is scanned and the synchronized data-set is time stamped
- Programmable focus on specific areas of interest with more sensing points
- DNP3, IEC 61850-GOOSE protocols; 10BaseT, RJ45, TCP/IP; cloud server upload

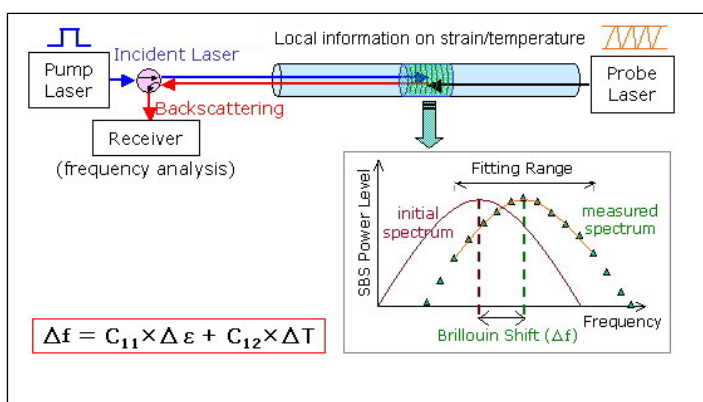
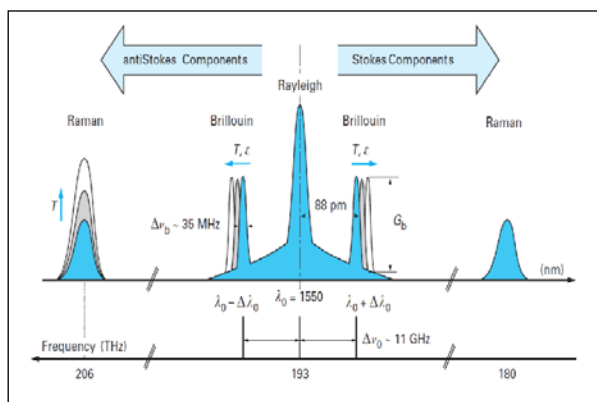


• **Technical Data:**

- **Controller:** 3U 19" rack mount; 100-240VAC or 24-120V DC; 200W; IP40/20 (F/B); 8.1 kg.
- **Fiber:** Selectable fiber type to suit measurement application
- **Ambient Operating Temperature:** -40 deg C to +80 deg C; 95% RH non-condensing
- **Environment:** EHV, Explosive, EMI, RF, Substation (IEEE1613, IEC61850-3) compliant
- **Fiber Dielectric:** Full withstand (air & oil) for AC 60Hz and Impulse wave (standard and switching surges)
- **Software:** Cloud-based software with analytics and 3D visualization

• **Operation:**

Self-contained all-in-one controller which houses both the optics and power electronics. The two ends of the fiber loop are fed into the optical ports. Measured data can be stored locally or exported periodically.



# Tech Talk: Power of Optical Sensing

CTMS does the work of thousands of thermocouples and strain gauges.

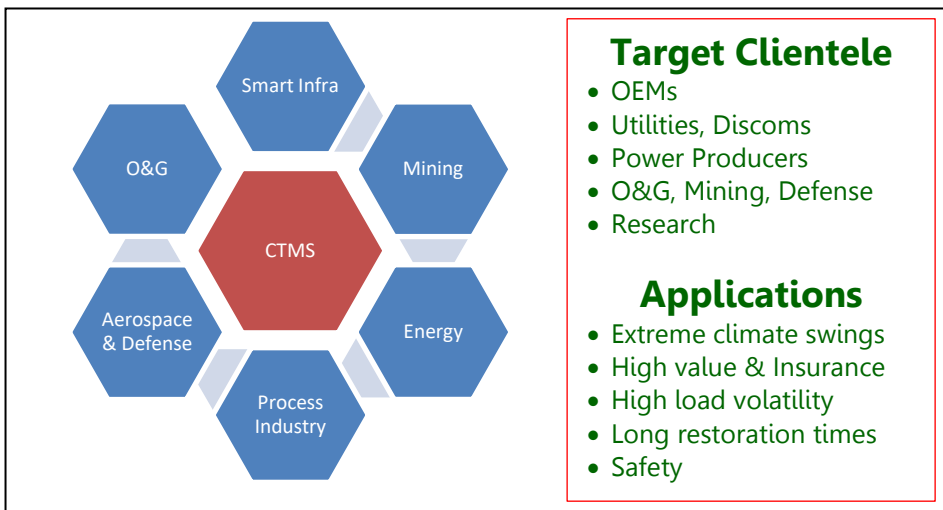
*Simple, Inexpensive, Scalable.*

Climate Change, rising ambient temperatures and its volatile swings is requiring existing electrical power assets to be de-rated. This is a huge financial impairment. *Managing real-time thermal limits in operations overcomes this derating.*

The performance of cables is dependent on its ambient temperature, its conductor temperature, direct sun radiation (if overhead) and its electrical loading. High conductor temperatures along with high electrical load is bad for its performance and safety. Such thermal violations and overloading reduce their useful life (cumulative degradation) and cause failures (even fires). Remediation and replacement are expensive.

The CTMS system allows both temperature and strain to be mapped along the cable using the "Stimulated Optical Brillouin Scattering" principle. This scattering shift is proportional to the temperature and strain at each point of measurement. The strain measurement allows for accurate fault location. Each synchronized data set (sampled across the whole length) is time stamped. For example, a 10 km fiber loop, measured every meter, at 15-minute intervals, yields about 40,000 synchronized, time-stamped data every hour. This can be fed in real-time into a SCADA or BMS or a Cloud system to manage asset performance for operating conditions and capability to accept projected on-coming load.

CTMS systems are now globally recognized as reliable technology for thermal/strain monitoring of power cables. It enables real-time cable monitoring, thermal protection and prevents localized hot-spots before failures can occur. Such temperature profiles allow for system-wide mapping and comparison of entire power cabling assets and their routes.



## Typical Applications

T&D Utilities, Power Plants, RE, IPPs



Discom HV/MV/LV Cables



U/G Duct/Conduit/Cable Thermal Profiles



Fires in Cable Vaults, Trays, Risers



## And Savings Too:

*This ensures lower costs, greater ROI and a scalable speedier long-term solution. A two-for-one benefit.*

## Best Value Applications:

Parameters	Platinum Savings	Gold Savings	Silver Savings	Bronze Savings
High Value Asset (> 1.5 M\$)	*****	****		
Long-lead Replacement	*****	****		
High Insurance Asset	*****	****		
Fire & Safety Implications	*****	****		
OEM Prototyping/Validation	*****	****	***	**
Academic R&D Labs		****	***	**
Extreme hot/cold climate	*****	****	***	
Typical Pay back (simple ROI)	1 Year	2 Years	3 Years	4 Years

## Biosirus Inc.

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or a trial project**