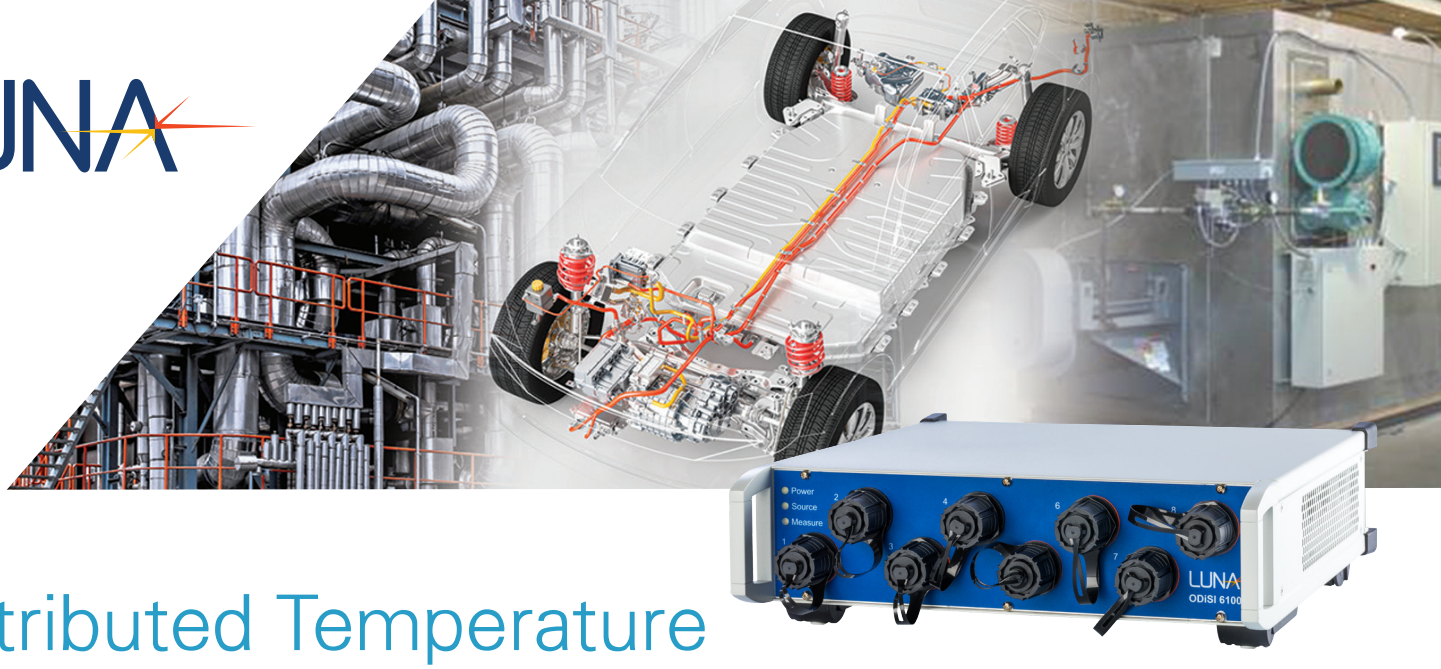


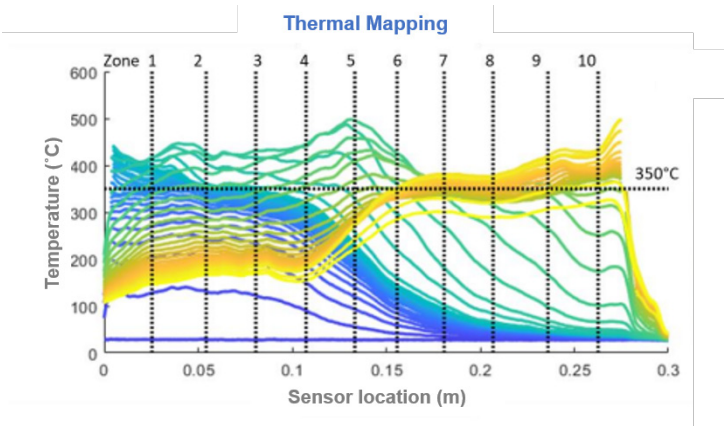
Distributed Temperature Profiling System

High-Definition Distributed Fiber Optic Sensing

The ODiSI 6000 is an innovative measurement system that uses versatile fiber optic sensors to map temperature with the highest spatial resolution available.

The ODiSI system provides essentially continuous sensing of temperature or strain along a single fiber optic sensor, allowing the real-time mapping of the full thermal profile or strain contour with a drastic reduction in wiring and cabling.

The sensor is flexible, low profile, requires no electrical source and can be bonded to sharply curved surfaces, embedded within structures or mounted directly to electrical surfaces.



The ODiSI system measures temperature linearly along a flexible sensor with very high resolution, delivering complete thermal profiles in real-time.

Acquire high-definition temperature maps using fiber optic sensors.

KEY FEATURES

- **Measure distributed temperature**
- High-resolution, real-time thermal profiling
- Easily pinpoint thermal details; detect all hot and cold spots
- **Flexible, lightweight** and easy-to-install sensors reduce time to first measurement
- Passive, corrosion resistant, dielectric **sensors go where other sensors can't** — in bends, corners, embedded inside materials
- **Easy-to-use** application software simplifies configuration,

APPLICATIONS

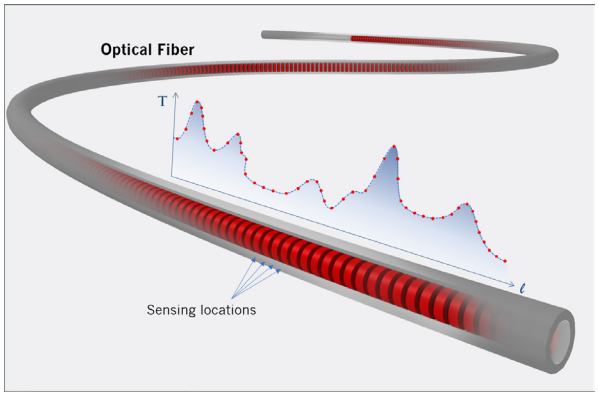
- Profile temperature in-situ to maximize the efficiency of critical processes
- Thermal profile of multi-material joining and curing processes
- Thermal test of batteries and power electronics
- High-resolution mapping of reactors, heat exchangers, storage tanks and more

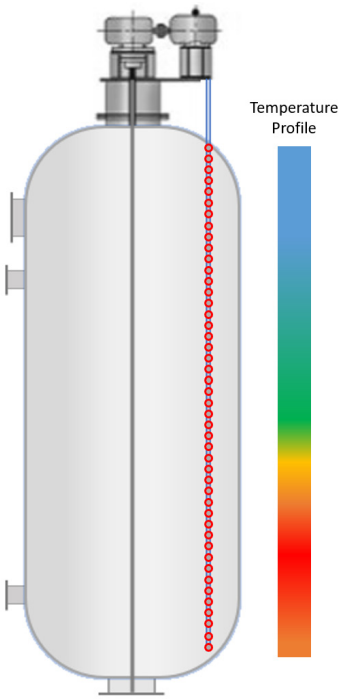
DISTRIBUTED TEMPERATURE PROFILING

The ODiSI measurment system uses innovative fiber optic sensing technology to deliver very high-resolution distributed temperature measurements.

An ODiSI 6000 system, combined with the Luna HD-SC sensor provides gap-free temperature data with measurement points every 1.04 cm along the optical fiber sensor. This yields 96 measurement points per meter, or a total of 480 measurement points for a single 5 m long sensor.

The HD-SC fiber sensors are flexible, very low-profile and have a very low thermal mass, enabling easy measurements in constrained spaces and in challenging locations.



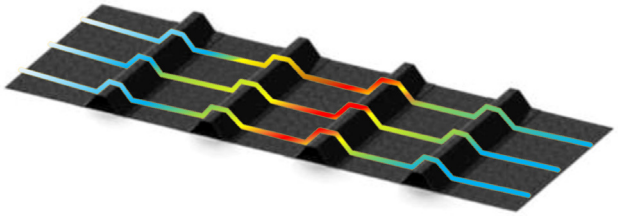


Generate high-definition thermal profiles of reactors with a single, small sensor.

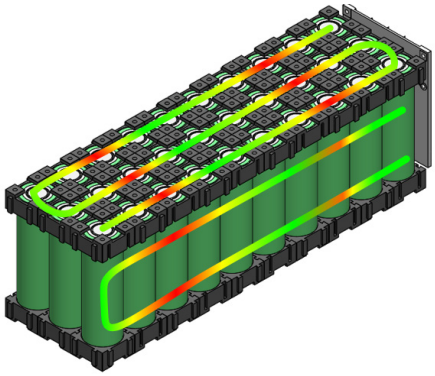
RELIABLE MEASUREMENTS USING OPTICAL SENSORS

The ODiSI utilizes a distributed sensing technology that is based on the naturally occurring Rayleigh backscatter in optical fiber and provides near-continuous temperature profiles with a single optical fiber. Additionally, the ODiSI measurement system provides many benefits of measurements based on fiber optic technology, including:

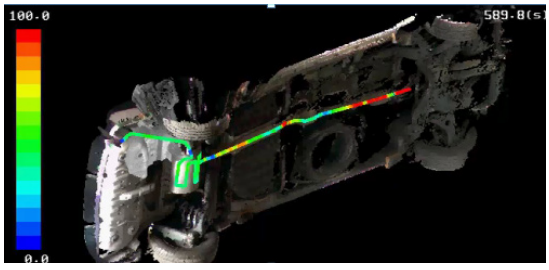
- Passive sensors
- Immunity to effects of EMI and high voltages
- Hundreds and thousands of measurement points on a single fiber
- Small sensors with low thermal mass
- Chemically inert; corrosion resistant



Flexible sensors provide continuous temperature profiles of complex geometries during joining and curing processes.



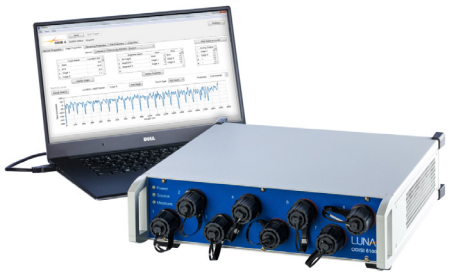
HD Sensors easily and quickly detect hot spots with high resolution and precision on battery cells, packs and pouches.



Easily install sensor where traditional sensors fail and imaging systems can't access.

LUNA

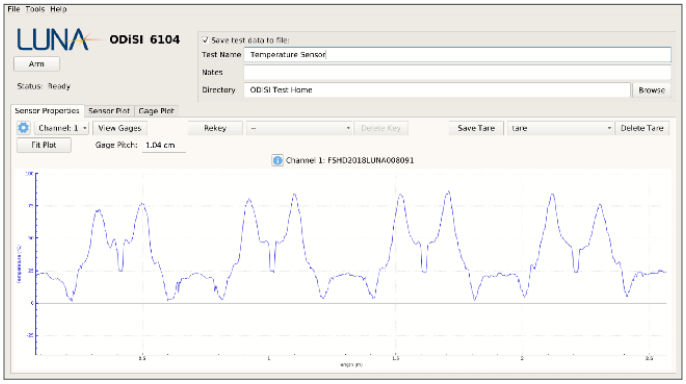
ODiSI MEASUREMENT SYSTEM



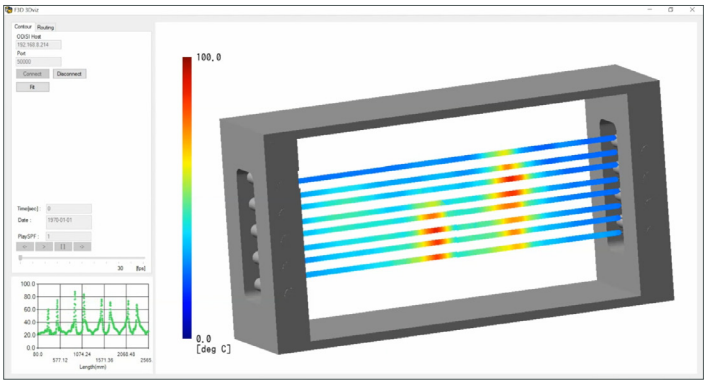
The ODiSI system comes configured with 1, 2, 4 or 8 channels able to measure a high-definition (HD) temperature sensor. In standard mode, each channel supports an HD-FOS sensor up to 10 m in length.

The ODiSI system includes a ready-to-use instrument controller and software to configure the system and to acquire, visualize and log measurement data.

- Automatic plug-and-play sensor identification
- Quickly identify and configure tests, including modes, timing, triggering and data logging
- Interactive touch-to-locate tool for identifying locations of key measurement point locations
- Save, replay and export measurement data files
- Real-time streaming of measurement data over Ethernet



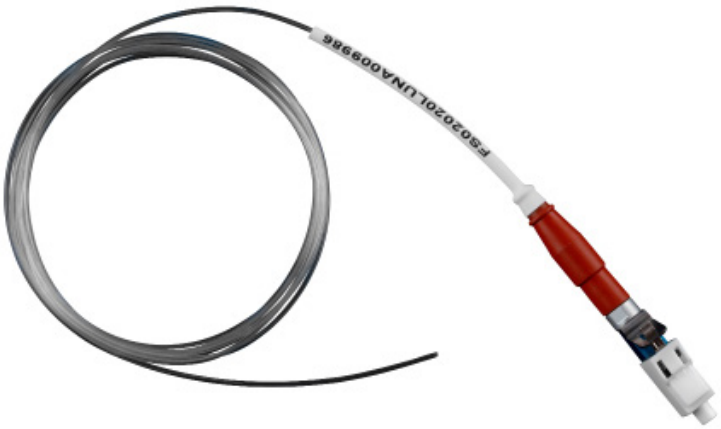
Multichannel sensor plot (strain/temperature versus length) in the ODiSI software.



Optional 3DViz visualization software maps and displays temperature data in real-time on a 3D model or 2D image.

HIGH-DEFINITION TEMPERATURE SENSORS

High-definition distributed temperature sensors are lightweight and flexible fiber optic sensors that can easily be attached or fitted to your application. The HD-SC temperature sensor employs a unque method to compensate for the mechanical strain that would ordinarily cause significant measurement errors when the sensor is attached or embedded. The strain-compensated HD-SC sensor, however, minimizes this error and delivers reliable and repeatable temperature measurements. The HD-SC sensor is available in lengths of 1 to 5 m and measures temperature every 1.04 cm along the length of the sensor. This yields 96 distinct temperature measurements for every linear meter of fiber cable.



Housed in a PTFE tube with an outer diameter less than 1 mm, the HD-SC sensor is easy to work with. Its strain-compensated opeation means it can be attached to curved surfaces and installed in locations that are very challenging for traditional sensors.

DISTRIBUTED TEMPERATURE MEASUREMENTS

An ODiSI 6000 system configured for distributed temperature measurements using the HD-SC temperature sensor has the following performance and capabilties.

Parameter		Specification
Number of channels		1, 2, 4 or 8 channels
Maximum sensor length per channel		5 m
Standoff cable length[1]		10, 50, 100, 150 or 200 m
Measurement gage pitch (distance between consecutive gages)		1.04 cm
Measuremement points (gages) per sensor	1 m sensor	96
	2 m sensor	192
	5 m sensor	480
Measurement rate		2.5 Hz (1 channel, any length) 0.3 Hz (scan of 8 channels, any length)
Measurement resolution		0.1 °C
Temperature sensor (HD-SC sensor)		Polyimide coated fiber in PTFE tube (with strain-compensation)
Temperature sensor outer diameter (HD-SC sensor)		0.89 mm
Temperature measurement range (HD-SC sensor)		-40 to 200 °C
Measurement uncertainty[2]		0.9 °C
Measurement accuracy with applied strain[3]		± 2.8 °C (over range of 0 - 1800 με applied strain)
System Operation		
Data logging		Onboard data logging (solid state storage)
Communications and data transfer		Ethernet (TCP/IP) and USB
Operating temperature range — mainframe and controller		5 to 40 °C
Operating temperature range — standoff cable and remote module		5 to 60 °C
Operating relative humidity (non-condensing)		10 to 90% RH

NOTES

1. A standoff cable connects the ODiSI mainframe to the remote module and sensor.
2. Measurement uncertainty is equal to twice the standard deviation calculated from a set of 1000 measurements. Measurement uncertainty includes the effects of the instrument and Luna sensors.
3. Measurement accuracy is the RMS error with the sensor subjected to up to 1800 με of strain. Error includes effects of the ODiSI interrogator.

ADDITIONAL CAPABILITIES

In addition to working with HD-SC temperature sensors for reliable temperature profiling, the ODiSI 600x system is also compatible with standard HD sensors for measuring distributed strain and non-compensated temperature. Refer to the ODISI 6000 Series data sheet for more information and full specifications.

ODiSI SYSTEM AND SENSOR ORDERING

Catalog #	Description
ODiSI 6001/2/4/8	ODISI 6000 Series Distributed Sensing Instrument System with gage pitch down to 5.2 mm. Includes system with 1, 2, 4 or 8 channels enabled, instrument controller laptop and ODiSI application software. Also includes one standoff cable and standard length remote module for each channel.
HD6SCTXXLC220P	HD-SC strain-compensated temperature sensors with PTFE sleeving, 200 °C, length = XX m

LUNA

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*Specifications subject to change without notice.