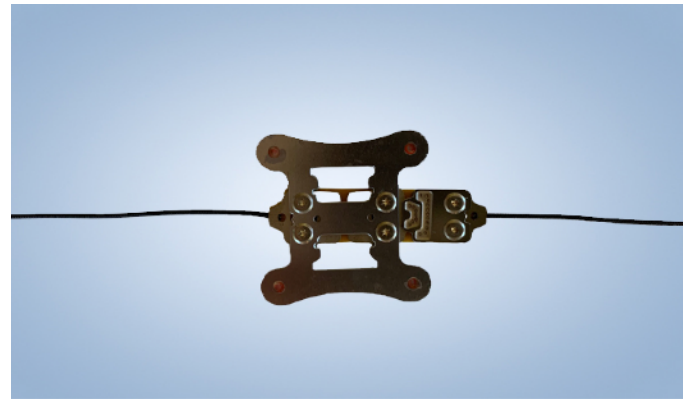


## Description

The T213 is a Single-Mode Fiber (SM) based advanced Fiber Bragg Grating (FBG) Packaged Surface Strain Sensor for use in environments from -270°C (~5K) to +40°C.

ATEX compliant for use in explosive environments and packaged to operate at ultra-cold temperatures. Ready for direct mounting and exhibiting excellent wavelength to strain linearity. Temperature compensated. The full-scale (FS) accuracy and precision specifications take into account any hysteresis, non-linearities, and the repeatability of the sensor. The T213 sensor handling and installation is fast, easy and intuitive. Delivers the advantages inherent to FBG based sensors including immunity to lightning and electromagnetic interference (EMI). Spot-weldable version for -270°C (~5K) to +120°C can be made available upon request.

T213 series Surface Strain Sensors are fabricated using licensed and proprietary state-of-the-art laser manufacturing technologies and product designs. The sensor packaging described herein represents the most popular configuration and can be customized.

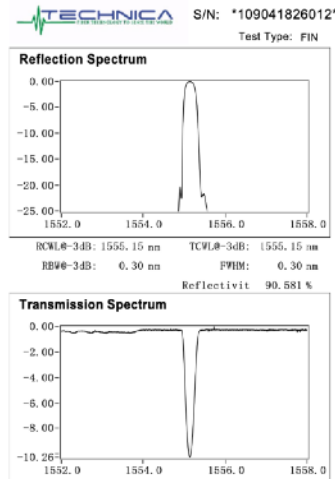


Manufactured and sold by Technica under International Licenses from Raytheon and Kawasaki Heavy Industries

## Key Features

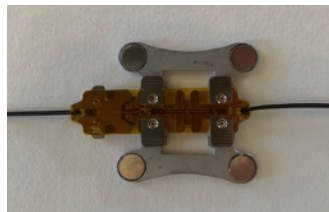
### Precise and repeatable strain measurements at cryogenic temperatures.

The advanced unibody T213 micro-structured design for temperature compensated strain measurements in ultra-low temperature environments uses two precision made FBGs written into the fibers' core and advanced materials technology for producing a transducer configuration of high resolution, precision, and repeatability. Standard and custom Reflectivity, SLSR & BW options are available.



### Ready to be daisy chained.

Well suited for projects that include the need to monitor strain on structures at cryogenic temperatures at one or many locations. Provided as single connectorized sensors or can be configured at the factory in ready to install sensing arrays of various lengths and with a flexible number of T213 strain sensors.

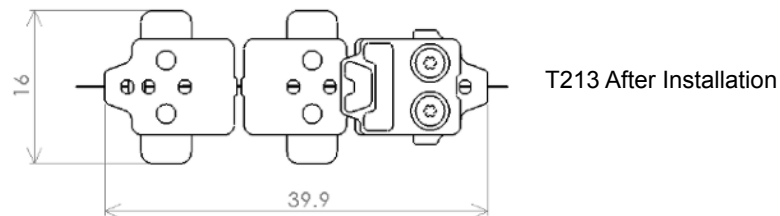
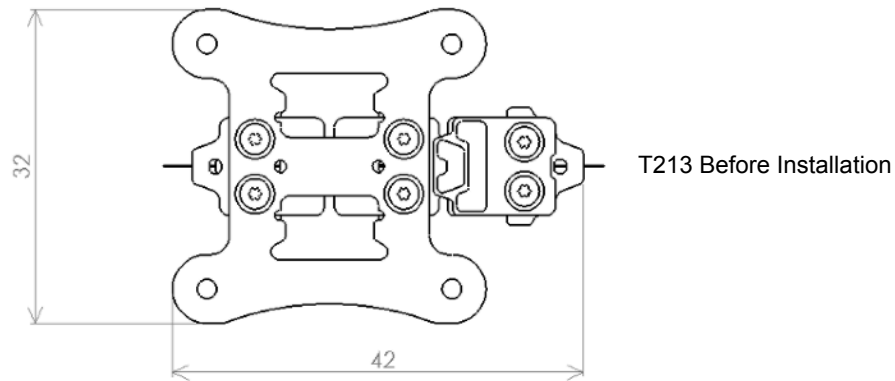


Field proven with hundreds of completed installations. For demanding projects that require stable operation for the long-term.

| Parameter                    | Specifications                                            |
|------------------------------|-----------------------------------------------------------|
| Wavelengths and Tolerance    | 1510 to 1590 nm, +/-0.5 nm; 980, 1060, 1310 nm, other     |
| Reflection BW (FWHM)         | 0.25 nm to 2.0 nm                                         |
| Reflectivity %               | 75% (1% to 99% available)                                 |
| SLSR                         | 15 dB; other options                                      |
| Gage Length and Range        | 10 mm and +1500/- 5000 μe                                 |
| Strain Accuracy              | <0.5% FS (<0.25% FS typical)                              |
| Strain Precision             | <0.25% FS (<0.15% FS typical)                             |
| Temperature Compensation     | Integrated within the sensor                              |
| Sensor Pigtail (Length, DIA) | 1 m and 1mm, other options                                |
| Cable Bend Radius            | 20 mm Static, 30mm Dynamic                                |
| Optical Connector            | FC/APC, LC/APC, other options                             |
| Housing Material             | Stainless Steel SUS304                                    |
| Dimensions LxWxH             | 42x32x2.8 mm before and 39.9x16x2.5 mm after installation |
| Weight                       | 7.5 grams before and 3 grams after installation           |
| Mounting Methods             | Epoxy for Low Temperature                                 |

## Applications in LNG Marine, Aerospace, Industrial, Medical, and Research Laboratories

Technica undertakes a rigorous development process before products release. The company is also firmly committed to continuous improvements after release to insure performance to the highest standards, hence, specifications are subject to update without notice.



## Additional Support Information

T213 Cryogenic Temperature Compensated Strain Sensor Installation Video.

Published paper with field deployment results “Development of Fiber Bragg Grating strain sensor with temperature compensation for measurement of cryogenic structures” by Kawasaki Heavy Industries.

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