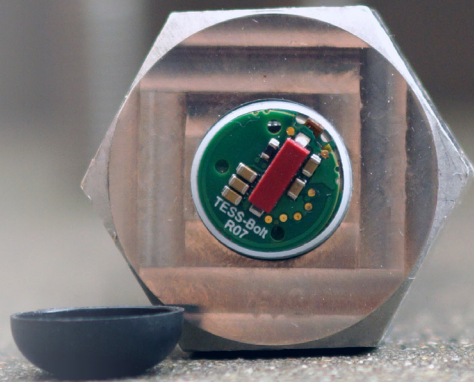**Strainlabs**

Get valuable & actionable application data from IoT bolts

Strainlabs is a Swedish IndTech company on a mission to empower asset owners with continuous bolt preload insights. The system enables monitoring of multiple applications, machines, or sites by developing the industrial digitalization of bolted joint technology. The sophisticated solution includes bolts with patented LED-sensors that communicates via a router to an analytical software.

User-friendly application data aggregated automatically & remotely:

✓ A standardised construction design element, holding the construction whilst gathering data.

✓ Ensure installation accuracy and avoid failures before they happen with preload alerts.

✓ Enables insights for competitive advantage & learnings to enable increased asset up-time.

✓ Supports Industry 4.0 and reduction of service costs with Condition Monitoring / Predictive Maintenance.

A COMPLETE IoT SYSTEM

BOLTS

Connect an unlimited amount of preload-sensing IoT bolts using patented led technology.

ROUTERS

Pre-configured routers to receive and upload data results from the bolts to Strainlabs Analytics.

ANALYTICS

Enables remote monitoring and alerts for Strainlabs Bolts. Aggregates quantifiable data.

Strainlabs AB
www.strainlabs.com

+46 (0)46 2864000
contact@strainlabs.com

Internet of Bolts

Strainlabs

Smart preload analysis for smart condition monitoring

Preload (F_0) is the axial force in the bolt introduced by tightening which causes a reactive clamping force (F_C).

Preload changes over time due to settlements, thermal cycles, dynamic load or vibrations.

Strainlabs Analytics will alert users when a bolt approaches the recommended maximum or mininimum functional preload.
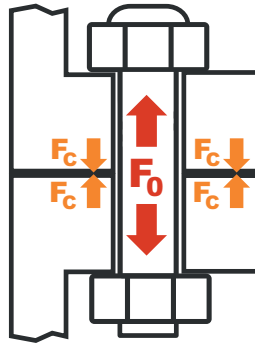
Functional preload

max *Exceeding the functional preload risks yielding of bolt, the threads or the strengths of the clamped surfaces.*

min *Going below the functional preload risks sliding between clamped parts or lost contact (unintentional loosening).*

BOLTS

CE-marked
with Intertek ((CE

Standard sizes
M10, M12, M16, M20, M22, M24, M27
Length 30-200 mm
Steel 8.8, 10.9 or 12.9
Stainless steel
A4-70, A4-80 or Bumax® 88, 109
Special alloys

Type
Hex head, fully or partially threaded
ISO 4014/ISO4017

Operating Conditions
- Minimum clamp length: 10 mm
- Temp range -30°C / +70°C

Preload Monitoring
- Tightening mode: Direct feedback
- Active mode: Every 10 minutes
  (reduced interval when below -0ºC)
- Pre-calibrated alert levels,
adaptable

Additional IOT Features
- Temperature data & thermal
  compensation
- Micro controller / Smart battery
  management
- Unique ID, position & time tracking
- Band width ISM 2,4 GHz
  Proprietary protocol

Battery Lifetime
- Simulated to 5 years in
room temperature

ROUTERS

Type
Industrial IoT router
from Multitech®

Software updates
Automatic & remote

Communication
Ethernet/LAN, Wi-Fi,
4G LTE.

Range
Stable up to 90 meters
between bolt and router
(free space)

Power connection
100-240 V, including
EU & UK adapter

Antenna
RangeAnt MAX +3dBi
Omnidirectional

ANALYTICS

Installation
Agnostic, in the cloud or
installed locally.

Monitoring
Overview per site scalable
down in multiple levels to
the specific bolts.

Functionality
Automatic illustration of
measure data. Keeps track
of unique bolt IDs, routers
and where they are
located. Pre-set alert
levels for functional
preload range per bolt.

Value
The aggregated data
creates insights beneficial
for asset planning and
product development.

Potential
The data enables future
analysis with AI.

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