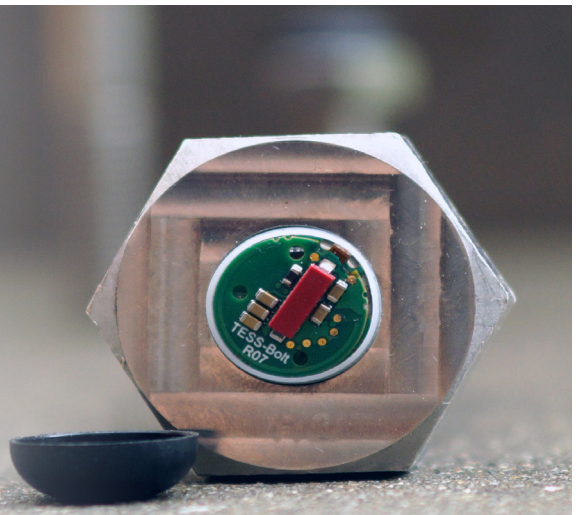
Smart bolts that monitor themselves 144 times per day

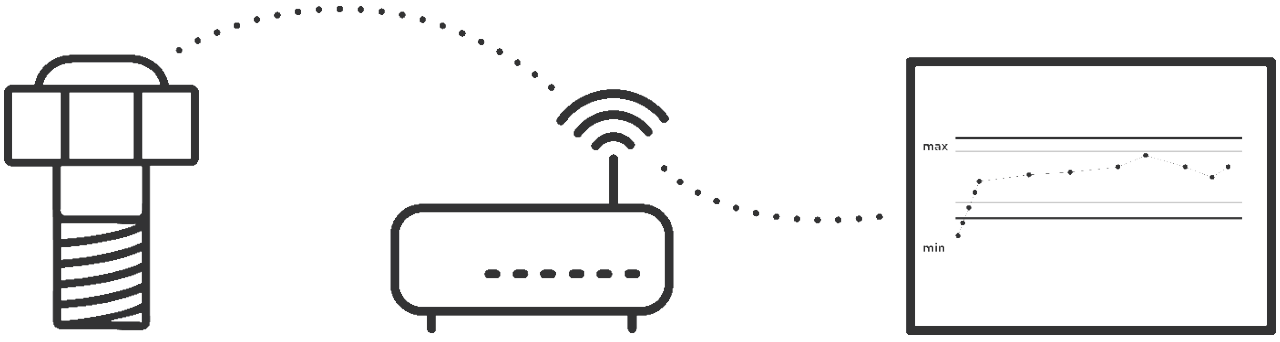
Strainlabs helps industries understand what's happening inside their bolted joints, before something goes wrong. Instead of relying on manual inspections or assumptions, our bolts measure their own preload 144 times per day and show how it changes over time. That means earlier warnings, fewer unexpected stops, and better decisions based on real data, not guesswork. The system connects sensors, hardware and analytics into one solution. So you can move from reactive maintenance to real insight.

Control you've never had before

- Early warnings instead of emergency response. Detect a joint losing preload weeks or months before it leads to failure.
- Monitor a single critical joint or thousands of bolts across multiple sites. Same system, same dashboard.
- Replace calendar-based routines and manual spot checks with decisions driven by real data and long-term trends.
- A complete picture of how every joint performs over time. Data you can share with suppliers, auditors and decision-makers.



A complete system



BOLTS

Our bolts measure preload every 10 minutes, automatically detecting changes caused by heat, vibrations or dynamic loads.

ROUTER

Readings are sent wirelessly to our monitoring systems. No manual collection. All data at the same place: Strainlabs Analytics.

ANALYTICS

Monitor bolt condition in real time, track changes over time, and get alerted before small shifts become costly failures.

Strainlabs AB
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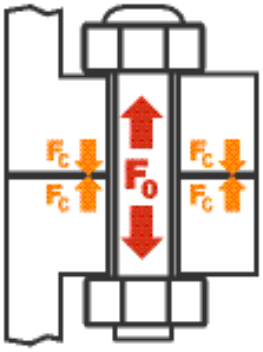
Strainlabs

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

Sizes
M10 - M36
Length 30-270 mm
Steel 8.8, 10.9 or 12.9
Stainless steel
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 -0°C)
- Pre-calibrated alert levels, adaptable

Additional IOT Features
- Temperature data & thermal compensation
- Micro controller / Smart battery management
- Unique ID, position & time tracking
- Bandwidth 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 VAC, including EU & UK adapter
9-32 VDC

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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