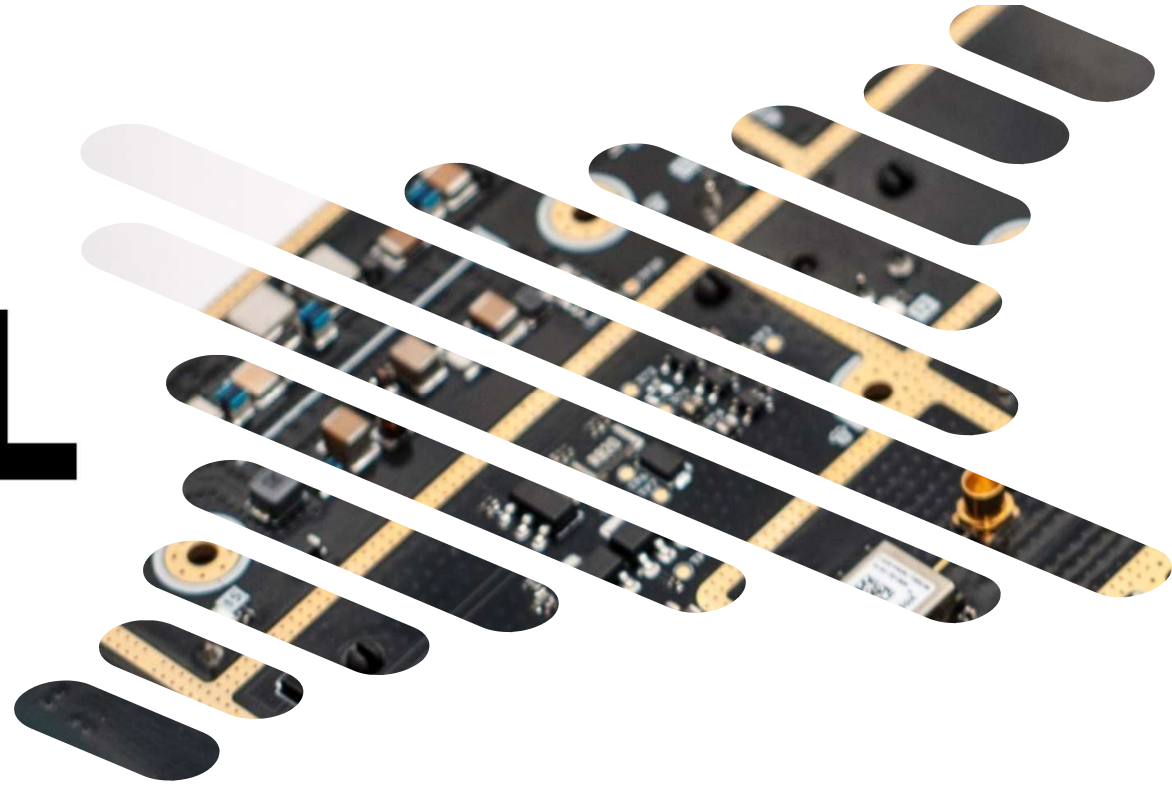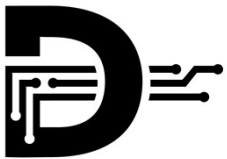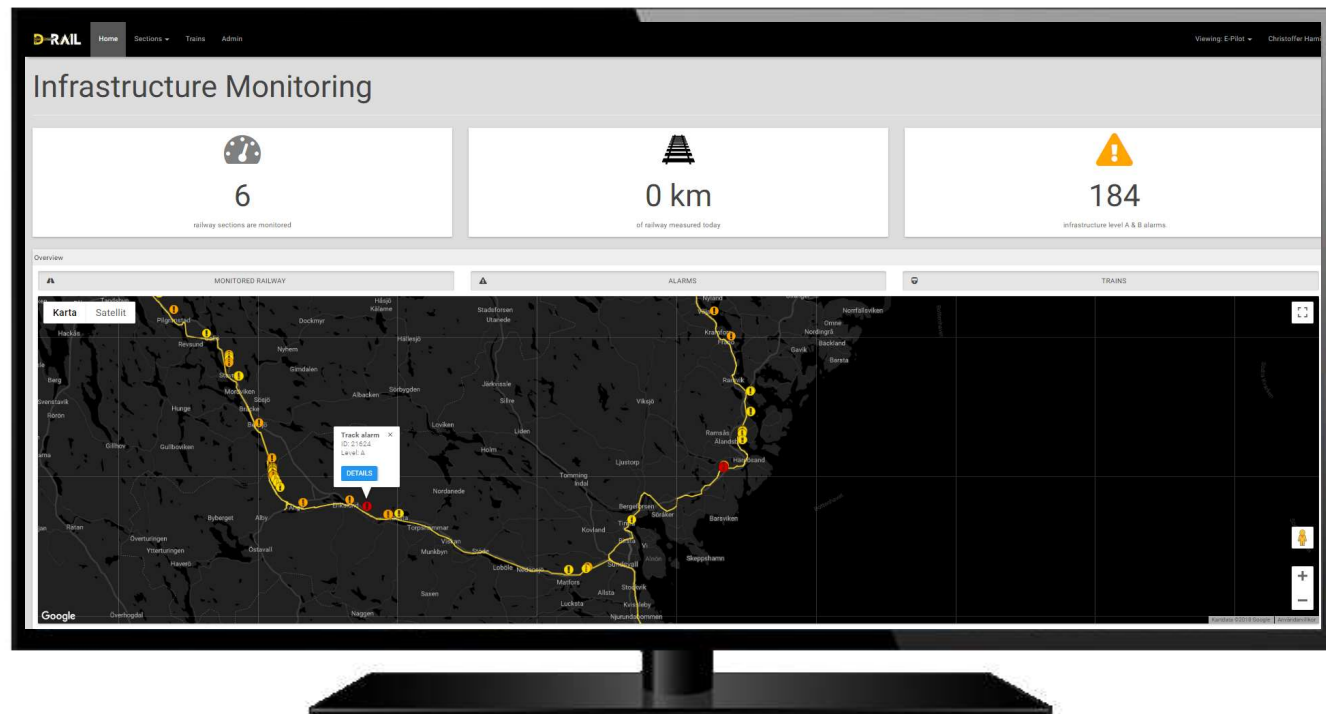# D-RAIL

KEEPING TRACK

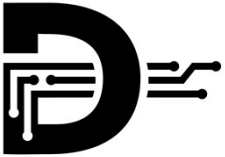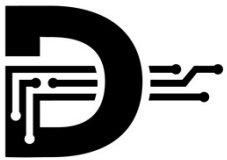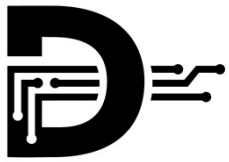# Infrastructure Monitoring As A Service
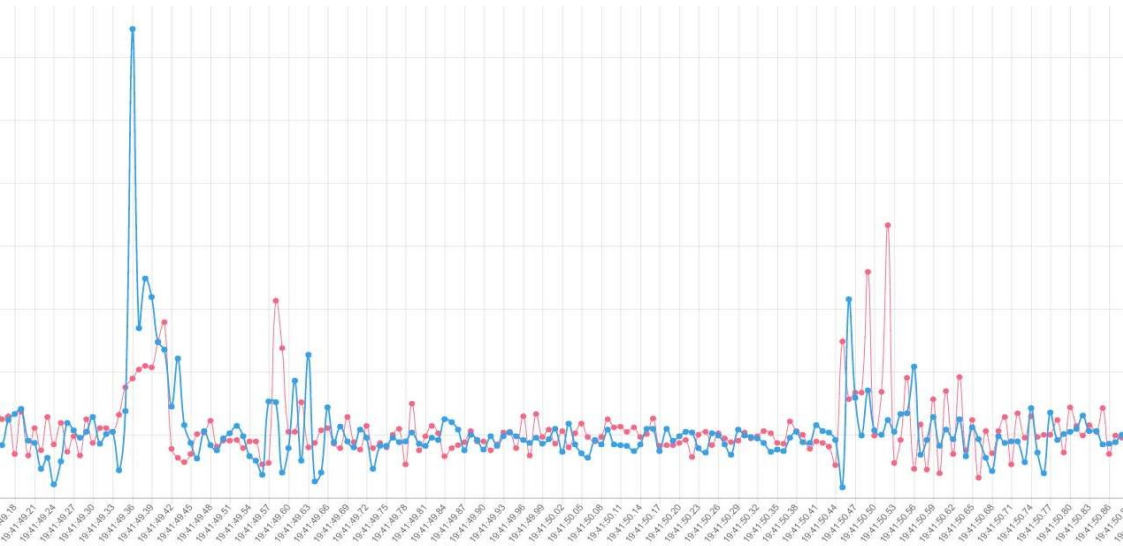
CHRISTOFFER HAMIN
FOUNDER CEO

WE NEED TO CHANGE THIS

D-RAIL Vision

"We are very pleased with the help we recieved locating a defect on the rail that was damaging wheels on vehicles of the Green line "

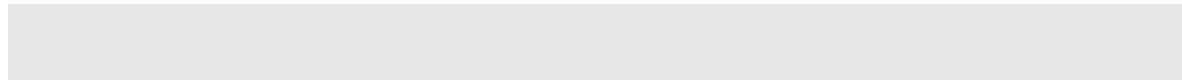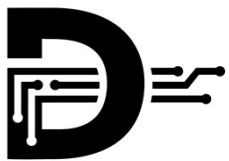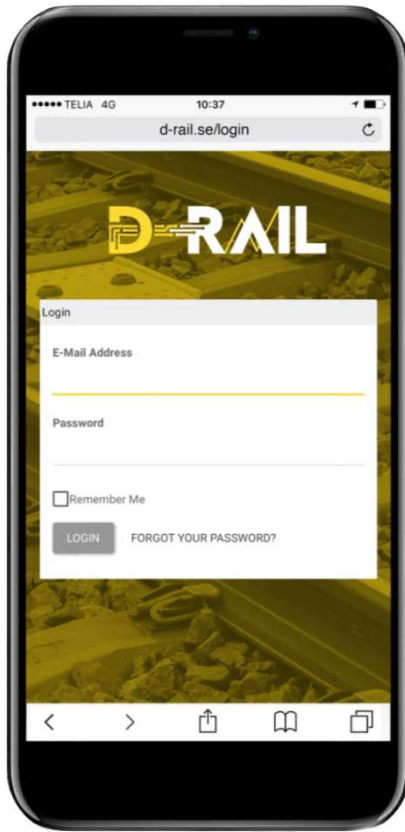# MAGNUS LÖFGREN
FLEET MANAGER MTR Tech

"I do not believe that our staff has even noticed that there is measurement equipment onboard"

LENNART SKOOG
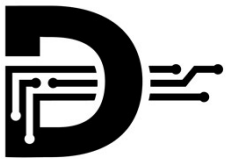FLEET MANAGER TKAB

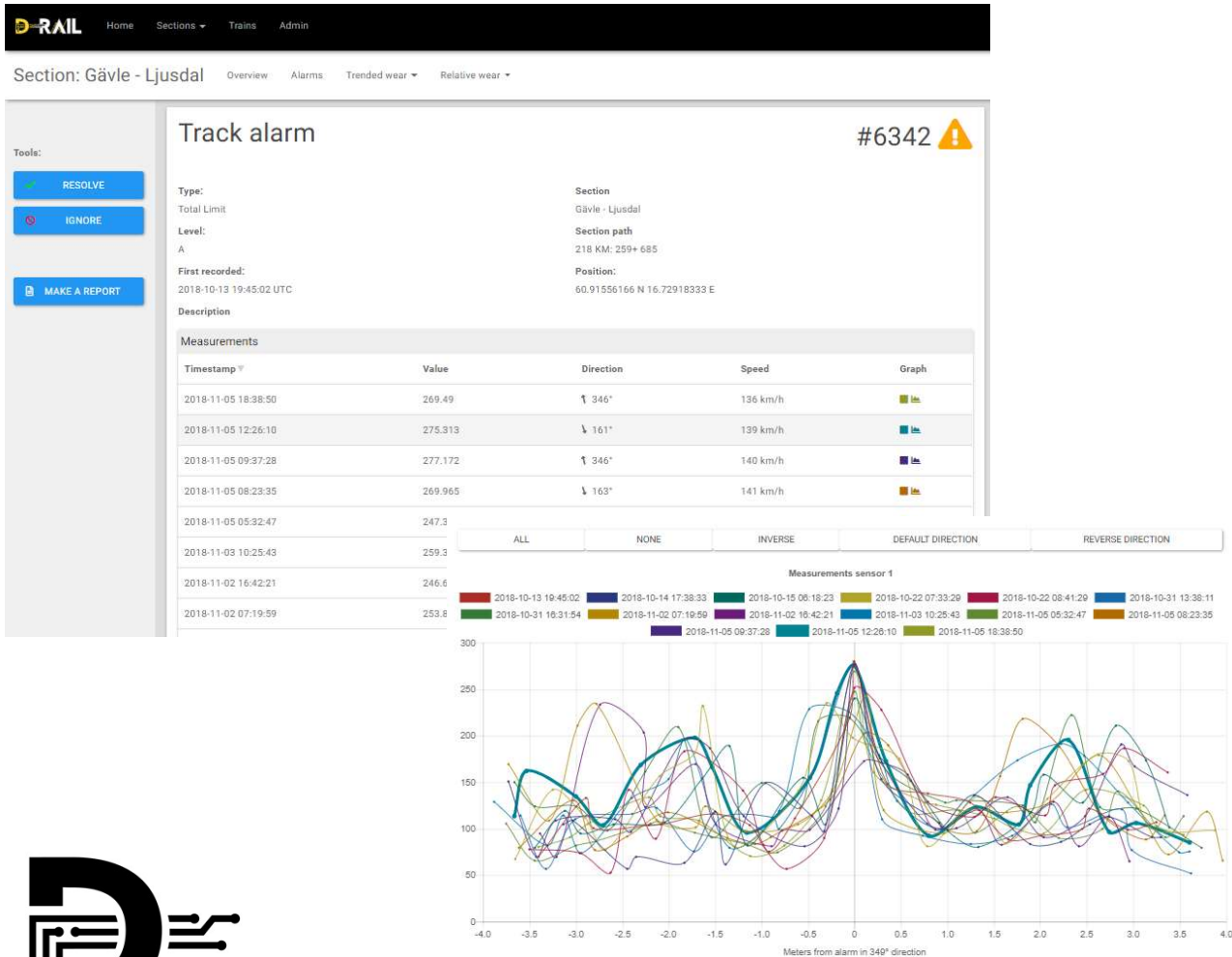# IMAAS

We provide a real time information online, from any device.

All information online is analysed and processed in the cloud by us.

The information does not need to be downloaded or processed locally.

The system

MEASUREMENT:
Relative movement and vibrations in very high frequency are harvested from specific locations to determine the indirect infrastructure status.

Unique blockchain inspired data management are used to make false or misplaced data impossible.

Unique handling from the very sensor chip all the way to the cloud is planned in the smallest detail.
All data is combined with positioning in millisecond level.

A few trains with a few sensors can save time, money and lives
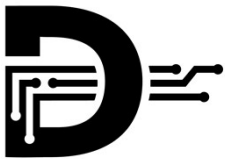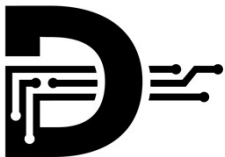
The system

PLATFORM OR API:
D-RAIL provides a platform for measurement analytics, alarm handling, internal communication, predictive maintenance and relative point of view to be able to prioritize maintenance needs.

The information can also be sent to a customers data hub if there is already a working platform at the customer.

**EXAMPLE OF AN ALARM,
UNDERMINATION CAN COME SUDDEN AND CAUSE ACCIDENTS**
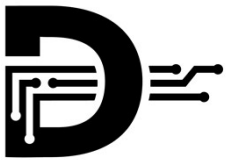
PREDICT

RAIL
Waves, defect joints and sun curves. Track geometry

SWITCHES
Relative behavior of switches when under load.
Point installed sensors for continuous monitoring

CATENARY
Relative height, position, wear and defects.

TRACK BED
Undermination, slopes and banking of track.

THIRD RAIL
Misalignment and defects.

BALISES
Relative function of balises regarding correct sending
and modulation.

WHEEL DEFECT DETECTION
Point installed sensors can act wheel monitoring
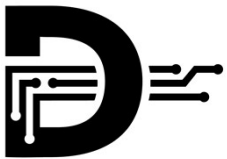
VALUE

AUTOMATIC ALARMS
Triggered algorithms pin-point errors
with type, severity and position.

TRENDED WEAR
How does the infrastructure change at
one geographic position over time?

COMFORT
Spot passenger comfort problems
by relative forces in the train.

RELATIVE CONDITION
The condition of the railway is shown relative,
and differences along the
same route on the same day.

VEHICLE STRESS
Spot places where the trains receive
stress-related problems on wheels, bogies and
pantographs.

The system

SENSORS:
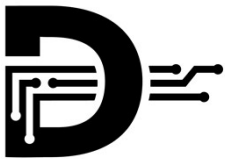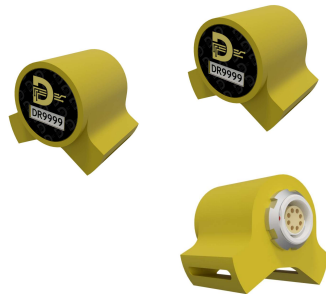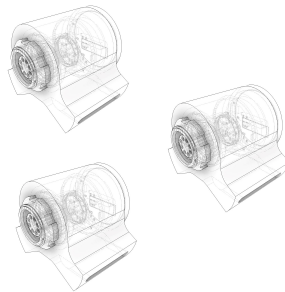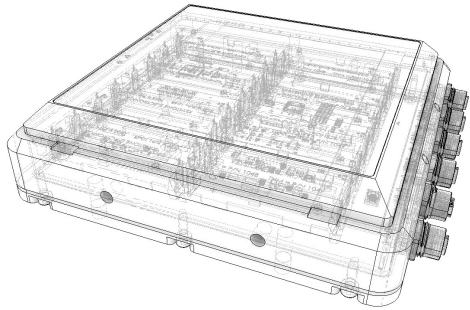Cutting edge technology designed for minimum maintenance and maximum performance.
The sensors are developed to measure the status of tracks, track bed, catenary and signal system, and can do this from any train.

They are designed to fulfill EN50155, EN50121, CE, IP68 and IK10. etc.

The sensors are completely autonomous with a battery life, without energy harvesting, up to 2,5 years in full operation.

Combined with an energy harvesting circuit (magnetic field harvesting) extends the battery life up to infinity.

Without energy harvesting, the sensor is charged on the train inside the depot. 1 hour = full charge.
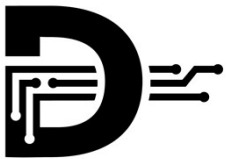
The system

INSTALLATION:

1 gateway & 2 sensors (with 2 or 3 sensing devices) per train is all that is needed.

The sensors are developed for maximized ease of installation and done without a single hole being drilled.

Train specific documentations prior to installation is produced together with train operator/owner and signed by the necessary parts.

The system is CSM-RA considered to be a non significant change. And 100% reversible.

The system is owned and insured by D-Rail.
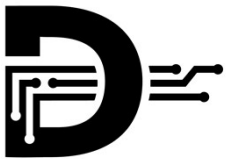
REFERENCES

At the very first POC run with our very first prototype put together in the basement we found defects in the railway infrastructure needing repair.

The evolution of our R&D and our reference projects we have (at least) saved overhead wires from falling down and preventing thousands of wheels getting damaged by pin pointing defects early.

From having asset managers afraid of the amounts of alarm that would come when measuring every day to later thanking us and asking for more information.
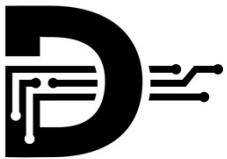
D-RAIL

LAUNCH FEBRUARY 2019

Ready to change the world,
disrupt the industry with real time
railway information and prediction.

Ready to make railways more safe
and save, time, money and lives
around the world.

D-RAIL.COM