



TeamViewer IoT for **Remote Alarming**

Remotely monitor, set alarms, and trigger automated actions, increasing revenues, improving customer satisfaction, and mitigating damages



Introduction



Companies across industries are prioritizing IoT solutions as part of their strategic initiatives to optimize, automate, and grow their business at every level. But, attaining even the most obvious revenue and efficiency opportunities with IoT is not as straightforward as people assumed it would be. While **early adopters have paved the way**, they faced challenges and were only able to **implement IoT projects after multiple proofs of concept**.



Now, with a plethora of emerging IoT use cases ready for large-scale deployment, **late adopters realize they must act fast** or risk missing out on the **competitive edge IoT offers** – potentially jeopardizing their current marketplace standing.



One of these ready-to-scale IoT use cases is **Remote Alarming**. Most of its industry applications do not even need elaborate machine learning algorithms. Simple heuristics define the next best action for a specific error (e.g., sending the right technician, shutting down a running machine).



With a **rule engine, cloud dashboard, and fully documented APIs**, TeamViewer IoT enables companies to set up **data- and rule-based remote alarming**. This allows you to **automate operational processes** and **catch problems before they escalate** and impact business.

What IoT Remote Alarming means

- **Define rules for anomaly detection:** Set parameters and thresholds that trigger alerts if IoT endpoints show unusual behavior (e.g., a pump rotating slower than expected, a fridge exceeding a temperature threshold, a conveyor belt coming to a stand-still)
- **Create alarms to trigger actions:** Automate processes based on IoT threshold alerts that initiate the next action (e.g., generate contextual notifications or workflow tickets directed to the right resource, based on the data of your endpoint)

The Value IoT Remote Alarming Brings To Business



Increase revenue – help prevent production waste or stock loss



Mitigate risk of endpoint damage and cut down mean time to repair (MTTR) – alarm before machines break



Improve customer satisfaction – get early alerts of poor product or service quality, and fix before they impact customers

IoT market is on the rise fueled by three mega trends

The market for IoT is growing at ~20 percent p.a. receiving substantial attention and funding. IoT revenues are expected to double from ~\$230B in 2017 to >\$520B* by 2021 across industries.

Decision makers across industries are increasingly aware that **not investing in IoT use cases will affect their competitive position in the short- to medium-term.**

By 2021, **smart and connected endpoints** are expected to reach approximately **36 billion**** – 3 mega trends fueling IoT growth:



Massive increase in **computing power** and data processing capabilities



Drastic decrease in the cost of **connectivity, bandwidth,** and data storage



AI and Machine Learning innovation enabling better, automated decision-making

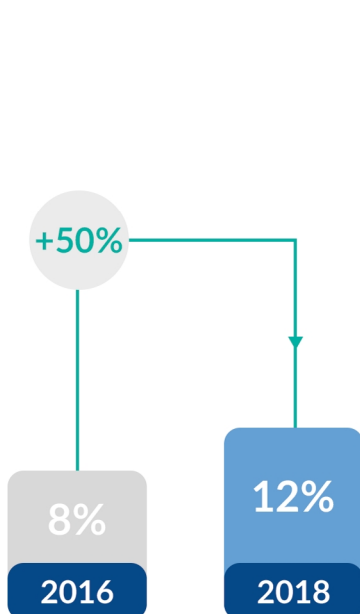
IoT adoption rising, but many companies still evaluating

Almost 50 percent of large enterprises and SMBs across industries*** in the US, Europe, and APAC, have engaged in IoT proofs of concept in 2018. However, only 12 percent of companies had entered into extensive deployments that year.

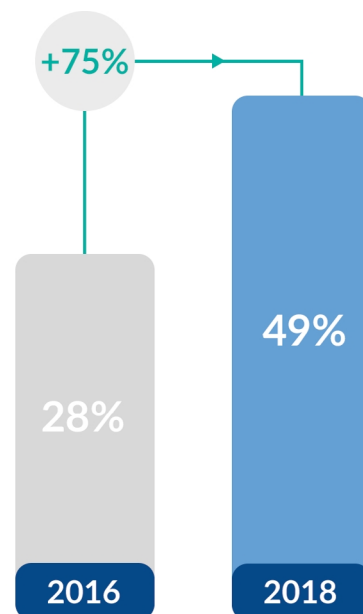
As more and more companies engage in IoT, the execution hurdles become more visible, while decision makers' view on the strategic importance has indeed solidified.

Companies by stage of IoT adoption

Extensive implementation



PoCs or partial implementation



Key lessons learned

Almost all **companies learn IoT through PoCs**

- Large enterprises often run **multiple PoCs in parallel** before entering large-scale deployments
- Many PoCs produce **mixed results** – often due to lack of rigor and cross-functional ownership
- Leaders in IoT adoption have built up substantial **internal use case and security know-how**

3 main challenges of moving from PoC to full-scale IoT deployment



Complexity of integration with IT and business processes – especially with legacy IT infrastructure



Uncertainty of returns on investment



Security concerns, especially regarding proprietary data and cyber attacks

* Source: Bain & Company; ** Source: IHS; *** Source: Bain & Company; survey decision makers across industries in US, Europe, and APAC; ~60 percent SMBs and ~40 percent LE, N=627 (2018) and 533 (2016)

TeamViewer “democratizes” IoT

Easy and fast setup, flexible integration



Get started immediately

- Install TeamViewer IoT on your endpoints/edge devices today
- Save deployment time through quick setup and smooth integration with enterprise IT
- Avoid building out complicated and hard-to-manage IoT VPNs
- Test your IoT concept with the TeamViewer IoT Starter Kit



Flexibly integrate and customize your IoT solution

- Compatible with most widely used protocols
- TeamViewer IoT easily integrates into several third-party platforms using TeamViewer’s SDK and ready-to-use APIs

Clear return on investment

Margin increase through a variety of positive business effects



Increase revenue – create alarms that trigger automated actions **preventing production waste** or **stock loss** (e.g., instantaneously reveal malfunctions in a paper press, through a vibration based alarming to minimize low-quality paper production)



Mitigate risk of endpoint damage and reduce mean time to repair (MTTR) – set **threshold alarms** to trigger automatic next **actions before machines break** (e.g., automatic shut down of a production machine with excessive vibrations, instant notification alert to supervisors if acceleration of fork lifters exceeds thresholds)



Improve customer satisfaction – get early indicator **alerts of poor product or service quality**, and fix issues before they impact customers (e.g., reduced or unusually fluctuating throughput of a critical pump, unexpected local temperatures in an air-conditioned building)

Low total cost of ownership and predictable investment with a SaaS license model (typically <6 months payback)

Highest security standards



Secure your data

- End-to-end encryption – no one, including TeamViewer, can read the encrypted data stream
- Store your data either in the TeamViewer cloud (hosted in Germany, ensuring GDPR compliance) or keep it in your network, and only send alarms by using TeamViewer’s rule engine on the edge – ensuring full data sovereignty in both cases

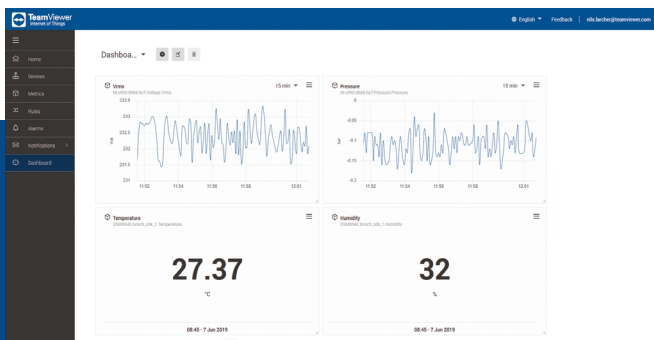


TeamViewer provides a second “safety net”

- TeamViewer IoT does not require your remote workers to be part of the company/machinery network
- This sets us apart from most VPN solutions that expose your company network to remote workers’ computer – and all the threats that it may host

Secure remote access, control, and monitoring for all your devices and machines

- Leverage our high performance, **low latency network** with >1,100 routers around the world
- Operate **touch control panels** remotely (“Remote Screen”)
- Access your **front-end machine management** remotely (“AppControl”)
- Get full control accessing the command line with our **Remote Terminal**
- Leverage TeamViewer’s **Global Access Network for secure connectivity**, no complicated VPN required
- Get **dashboard insights** with near real-time **edge visualizations of IoT data**, and **set rules to trigger alarms and next action(s)**
- Connect securely using our **end-to-end encryption** and state-of-the-art **authentication**



The screenshot shows the 'Devices' management page with a search bar and a 'Show all Devices' button. Below is a table listing various IoT devices with their group, sensor count, metrics, status, and alarm settings.

Device	Group	Sensors	Metrics	Status	Alarms	Control
Demo- Pump	IoT Demo Devices	9	9 metrics	Online		Control
Car (IoT NOT used)	IoT Demo Devices	4	10 metrics	Offline		Control
Demo- Car Parking	IoT Demo Devices	3	8 metrics	Offline		Control
Starter Kit 1	IoT Demo Devices	7	68 metrics	Offline		Control
PI4MB01CA002	Controls	3	4 metrics	Offline		Control
IoT Starter Kit 3	IoT Demo Devices	13	140 metrics	Offline		Control
ClientLaser on-board	IoT Demo Devices	6	0 metrics	Offline		Control
Smartage-627G2 (Smartage)	IoT Devices	6	0 metrics	Offline		Control
Smartage-1940EY (Smartage)	IoT Devices	6	0 metrics	Offline		Control
IoT-Access (Johannes)	IoT Devices	6	0 metrics	Offline		Control
Starter Kit 4	IoT Demo Devices	7	58 metrics	Offline		Control

Predictable costs and simple pricing model



Predictable endpoint-based fee for the most common IoT use cases



High-volume discounts, no hidden costs

Get started today with a TeamViewer IoT Starter Kit

Test your IoT concept, build a **fully functional POC** with a TeamViewer IoT Starter Kit. Get all the hardware and software components you need to **kickstart your IoT project** with **instant connectivity, monitoring, and remote control**.

- **Avoid high upfront investments** while having a secure end-to-end encrypted solution that can easily be scaled

Price: €1,990 (Europe) or \$2,249* (US and APAC)

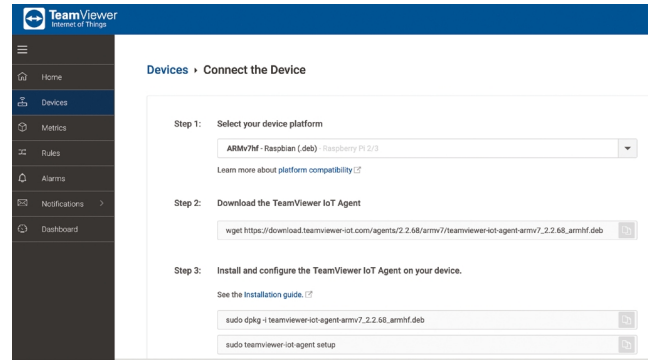
TeamViewer IoT Starter Kit includes:

- **1x Dell 3001 Edge Gateway** including antennas and connectors
- **3x Bosch XDK110** with sensors measuring temperature, humidity, acceleration (vibration), light and gyroscope
- **1x TeamViewer IoT account**, 6-month license
- **One full day of onboarding training** & consulting services

*Suggested Retail Price (SRP) excluding Value Added Taxes (VAT)

TeamViewer tools & characteristics enabling fast deployment

- ✓ **Several SDKs available** for integration and customizing
- ✓ **Simple integration** into several third-party platforms
- ✓ Compatible with **most widely used protocols**
- ✓ Exposing functionalities via **documented APIs**
- ✓ **No complicated VPNs** or firewalls required



TeamViewer IoT – 3 use cases in 1 product



Growing ecosystem of partners

IoT Hardware Partners



Integration Partners



Platform Integration

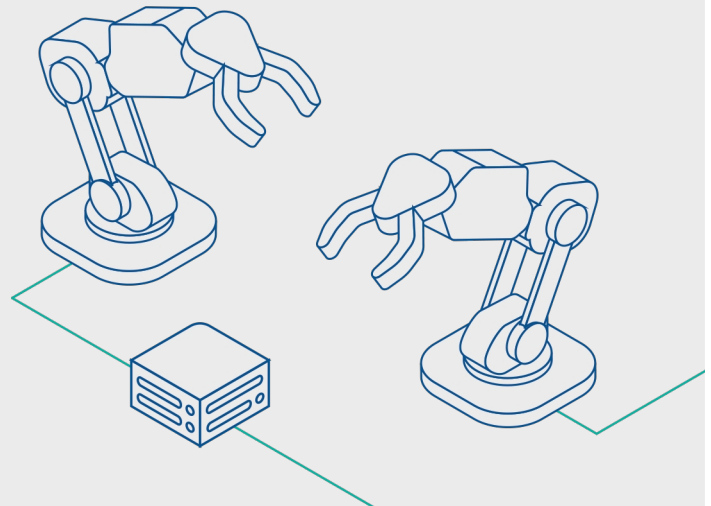


Discrete Manufacturing

INDUSTRY SPOTLIGHT

Many manufacturing companies determine servicing needs for machines based on analog alarms and scheduled intervals – the actual “health” of a machine is often unknown.

With IoT solutions, manufacturers get total visibility into the status and performance of their machines with real-time insights about the health of their equipment and devices. Moreover, IoT monitoring enables early detection when machines reach critical states, helping companies react quickly to mitigate risks.



With TeamViewer IoT, existing machines can be retrofitted with remote alarming capabilities, delivering immediate value, by allowing companies to increase operational efficiencies and decrease production downtime.

How does this help you?

There are many opportunities to reduce downtime and/or service costs:

- **Reduce production waste** by detecting anomalies in machines early
- Realize **less costly and more reliable testing results in quality control** by tracking machine data such as humidity, vibration or temperature – typically with payback <6 months*
- **Manage and keep track of alarms** in a centralized dashboard

What does this look like?

There are many relevant endpoints for remote, data based alarming in discrete manufacturing:

- Track the level of **lubricant in a manufacturing machine** and receive an alert if a refill is required
- **Detect overheated saw blades** in woodworking industries to reduce downtime
- Measure **vibration in production machines for sunroofs** to detect product issues early on

* Example: Annual warranty savings of € 400 per malfunctioning sunroof (0.5 percent of total output) through vibration- and noise-based alarming in quality control, compared to the corresponding costs for the TeamViewer IoT solution



How TeamViewer can help?

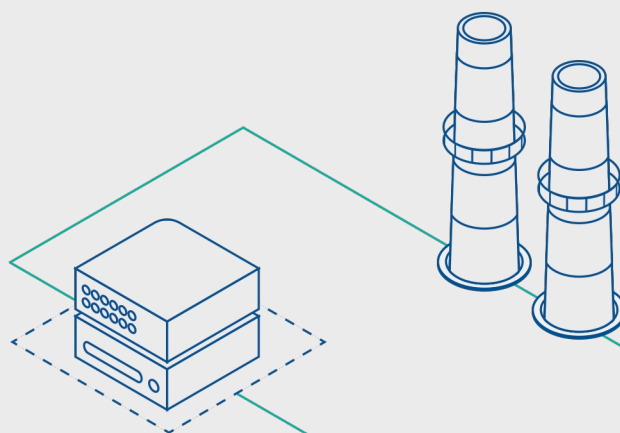
By using the **TeamViewer IoT rule engine**, you can **prevent machine failures** before they occur. Set thresholds and get real-time alerts for issues with **critical machines in your production environment**.

Process Manufacturing

INDUSTRY SPOTLIGHT

With large and often dispersed plants and remote facilities, the process industry has many IoT opportunities with immediate payback.

Opportunities range from setting up alerts, monitoring if the state of a machine exceeds a certain threshold to fully automating entire facilities (e.g., oil rigs, paper mills, chemical reactors) – significantly reducing the need for human interventions.



Given the detrimental effect that damage to equipment and facilities can have to both human life and/or physical assets, IoT solutions for the process industry need to be highly secure, reliable, and extremely robust.

How does this help you?

There are many opportunities to improve quality, reduce damage and/or reduce downtime using remote alarming:

- **Detect machine anomalies** right when they happen, **reducing production downtime**, with a payback period of less than 6 months*
- **Reduce product rejects** by setting early indicator **alerts for declining quality**, so you can fix issues before they impact your business
- **Reduce risk of severe machine damage** and expensive repairs

What does this look like?

There are various endpoints for remote, data based alarming in the processing industry:

- **Measure vibrations in paper press machines** and receive notifications of anomalies to ensure appropriate paper quality
- Receive an alert **if centrifugal pump pressure exceeds certain thresholds**
- **Detect the right time of blade replacement** in cutting machines, preventing them from dulling
- Reduce product rejects by remotely **tracking temperature and vibration in injection molding machines**

* Example: One FTE (average salary of € 60k p.a.) troubleshooting drives of two coke elevator drives per week with an average duration of 12h per service, compared to the corresponding costs for the TeamViewer IoT solution.



How TeamViewer can help?

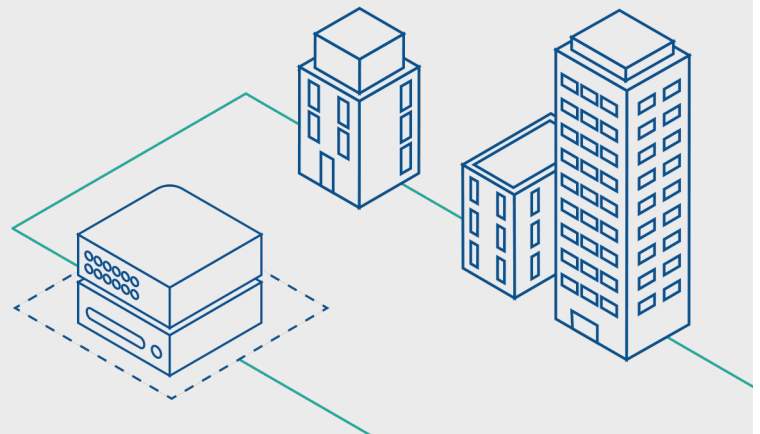
TeamViewer's IoT remote assistance solution for the process industry offers a **wide set of features to remotely troubleshoot and fix machines and devices** at anytime from anywhere, ultimately increasing efficiency and reducing costs.

Building and Infrastructure

INDUSTRY SPOTLIGHT

IoT opportunities in buildings and infrastructure range from monitoring and controlling single elements in a building to smart cities, connecting people and infrastructure.

While smart cities have not materialized in successful large-scale deployments yet, more practical and fast ROI use cases continue to gain traction.



Housing service providers, real estate developers, and hotel chains can leverage real-time data from IoT devices to make more informed decisions about efficiency, security, and hospitality.

How does this help you?

There are many opportunities to reduce cost of servicing and improve customer satisfaction:

- **Get notified when incidents occur** and remotely analyze the issue
- **Reduce expensive repair costs** and react in real time – typically with payback <6 months*
- **Meet sustainability goals and reduce energy costs**
- **Increase satisfaction of tenants**, by providing better building management and better service

What does this look like?

There are various endpoints for remote alarming in the building and infrastructure industries:

- Use sensors to **monitor temperature in laboratory buildings** to prevent experiment failures
- **Detect potential water leakages** before they happen by monitoring real-time **pipe pressure**
- Use sensors to **measure light and automate adjustments of sun blinds**
- Use **automatic warnings** for mission-critical equipment such as **elevators** to send alarms before equipment fails

* Example: One water-damaged endpoint per year with average costs of €2k to repair the damage, compared to the corresponding costs for the TeamViewer IoT solution



How TeamViewer can help?

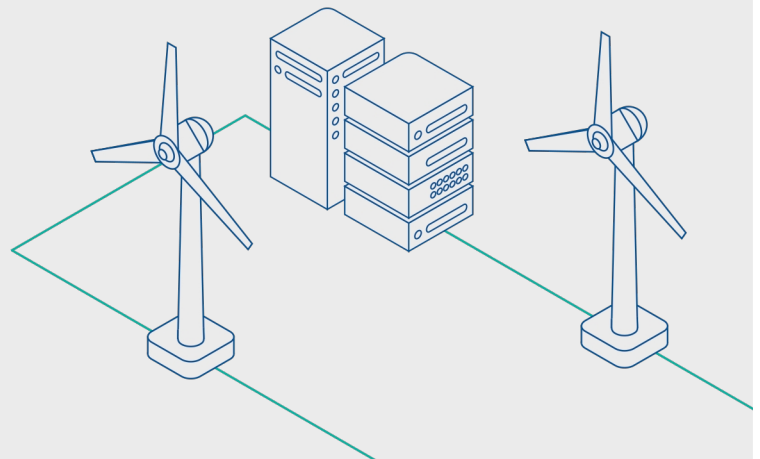
TeamViewer's rule-based engine allows you to **set up appropriate alerts if sensor data exceeds certain thresholds** and **trigger automated actions**. Our interface is easy to use and requires minimal training.

Utilities - Renewable Energy

INDUSTRY SPOTLIGHT

Utilities are famous for having the most mature large-scale IoT deployments: smart metering of electricity and heating consumption.

While smart metering has advanced with new connectivity types (especially low-power-wide-area mobile connectivity) and smarter data analytics, there is still economic potential around setting smart, data based alarms to enable faster, more targeted reactions in distributed renewable power generation and storage.



Constant regulatory and political interventions, promoting renewable energy, as well as growing customer environmental awareness, increase the need for more economical and efficient management of renewable power generation.

How does this help you?

There are many opportunities to reduce operating costs and mitigate damage risks by remote data-based alarming:

- **Detect incident occurrences** in renewable energy devices and remotely analyze the issues, effectively **reducing operational downtime**, with a payback period of less than 6 months*
- **Reduce risk of endpoint damage** by setting threshold alerts for harmful conditions
- **Reduce expensive repair costs** and react in real time

What does this look like?

There are various endpoints for smart, remote alarming in the utilities and renewable energy industries:

- Use rule-based engine to **trigger automatic wind mill shut-off** with strong or unpredictable wind conditions
- **Set warning alerts to notify** designated people **if solar panels no longer function**
- Save time and money by deploying the **right technician** for repairing **water purification systems** by remotely investigating the issue first

* Example: 3 accidents per year with average 5 days to restore full operations per wind mill (annual ~6k MWh production and ~€ 65k profit) avoided with smart alarming, compared to the corresponding costs for the TeamViewer IoT solution



How TeamViewer can help?

TeamViewer's IoT solution offers a **wide set of features to enable rule- and data-based smart alarming** for utilities and renewable energy endpoints, reducing cost and improving customer satisfaction. We provide an **exceptional expertise** that will enable you to **control and manage even hard-to-access devices** – anytime, from anywhere.

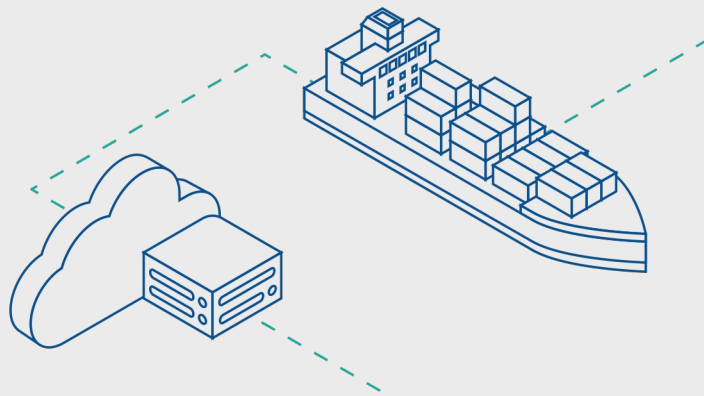
Logistics and Transportation

INDUSTRY SPOTLIGHT

Logistics and transportation is an early adopter of IoT (e.g., track and trace retrofits and in-car/in-truck dongles to monitor vehicles).

These IoT solutions have given leading logistics companies a competitive edge from more efficient use of resources (e.g. drivers, vehicles) and enabling them to provide better services (esp. delivery forecast, dynamic routing).

However, large economic potential is untapped in setting smart, remote, data-based alarms enabling faster, more targeted reactions.



Logistics and transportation volumes constantly grow, driven by globalization, e-commerce, and worldwide GDP growth. Supply chains become more complex while delivery times are shortened. As a result remote alarming becomes increasingly valuable.

How does this help you?

There are many opportunities to reduce cost and increase customer satisfaction by implementing IoT remote alarming:

- **Reduce waste in transported goods** by tracking transport conditions and setting alarms for harmful conditions
- **Increase operational efficiency** by tracking logistic efficiency KPIs and identifying patterns for underperformance
- **Improve customer satisfaction** by setting alerts for at-risk service level agreements
- **Reduce risks of endpoint damage** by setting alerts for harmful anomalies – typically resulting in payback time of <12 months*

What does this look like?

There are various transportation and logistics IoT endpoints where you can use remote alarming:

- Ensure sound condition of transported goods by measuring vibrations during transportation in **shipping containers**
- Optimize **airplane** maintenance efficiency by monitoring ground handling times and detecting patterns for underperformance
- Set **alerts for truck delays** to enable real-time actions and tracking updates
- Detect harmful anomalies in **harbor crane** operations data and trigger automatic shutdown before it breaks

* Example: 20 percent reduction in on-site maintenance time (part of health checks now conducted over the air) and cost reduction for on-site servicing expert (utilizing remote inspection results to deploy adequately skilled technician) assumed



How TeamViewer can help?

TeamViewer's IoT solution offers a **wide set of features** to support and assist transportation and logistics endpoints remotely, minimizing field support costs and reducing downtime. We provide **exceptional expertise** that will enable you to manage even hard-to-access devices — **at anytime, from anywhere.**



Talk to our IoT experts:

e-mail us

americaspartners@teamviewer.com

About TeamViewer

As a leading global remote connectivity platform, TeamViewer empowers users to connect anyone, anything, anywhere, anytime. The company offers secure remote access, support, control, and collaboration capabilities for online endpoints of any kind and supports businesses of all sizes to tap into their full digital potential. TeamViewer has been activated on approximately 2 billion devices; up to 45 million devices are online at the same time. Founded in 2005 in Goeppingen, Germany, the company employs about 800 people in offices across Europe, the US, and Asia Pacific.

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