+ MORE THAN A COMPRESSOR

A beginner's guide to connected compressors

How intelligent solutions such as **SMART**LINK boost uptime and reduce costs

GUIDE

Introduction – digitalisation is driving innovation

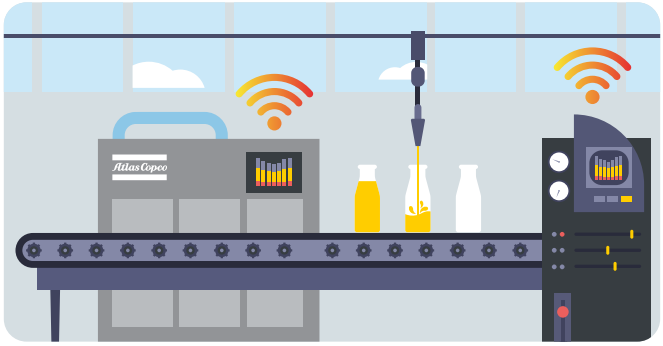
What sorts of connectivity solutions are available for air compressors? And what sort of insights can they provide? This e-Book aims to tackle the fundamental questions around connected compressors, enabling you to gain smart insights quickly and cost-effectively.

Digitalisation is having a transformative effect on industrial organisations. The combination of sensor-based data acquisition, wireless communication, and analytics gives engineers new insight into the performance of a broad range of assets.

By knowing how machinery and systems are performing - often in real-time - it is possible to make informed decisions, streamlining operations and delivering cost savings to the bottom line.

Connected compressors are a great example of this exciting innovation. The latest technologies mean you can check uptime, energy efficiency and machine health from remote locations via smartphones and other devices. This can help improve reliability and reduce energy usage across the factory floor. These days connectivity should be considered as a factor in the specification of a new compressor.

Deploying this kind of Industrial Internet of Things (IIoT)-based intelligent capability inside an organisation does not need to be costly, complex or time-consuming. Connectivity comes as standard on the latest generation of leading compressor brands, and it can be easily retrofitted to existing equipment. It therefore represents a quick-win and can give organisations the confidence to kickstart a broader programme of digital transformation.



Connected compressors – why now?

Compressed air is estimated to account for around 12 per cent of all energy used in industry globally – and it can be as high as 40 per cent in some facilities. It is a critical component in a modern factory, being used for an extensive range of applications, including powering pneumatic tools and production lines. Ensuring the reliability of compressed air supply, and optimising its use, are therefore vital considerations.

For many years now, smart controller technology has enabled plant managers to keep track of how compressors perform via MODBUS or PROFIBUS internet connections linked to a central plant management system. These types of control system act as the 'brain' of a compressor: collecting data via built-in sensors, processing it, and then delivering plant managers with an overview of how their compressed air system is performing.

However, recent advances in digitalisation and the emergence of concepts such as Industry 4.0 have resulted in a step-change in smart manufacturing. Now, technologies such as Atlas Copco **SMART**LINK make it possible to connect industrial equipment over a secure network to mobile devices, tablets, and smartphones. By facilitating remote monitoring, operators can keep track of key compressor performance parameters, including pressure, flow, motor, and dryer speeds, and make adjustments when necessary via a compressor's manual interface. This capability provides plant managers with far more flexible and meaningful insight into their day-to-day operations – improving efficiency and saving energy. Let us look in greater detail at how **SMART**LINK works and the sorts of benefits it delivers.

SMARTLINK at-a-glance

Seven things you should know about **SMART**LINK

What is **SMART**LINK?

It is a remote data monitoring system that can provide complete performance insight into compressed air production.

Why is such information useful?

Knowing the status of compressed air equipment at all times acts as the best way to spot any developing problems, reveal potential energy savings and deliver maximum uptime for compressors and production lines.

How does it work?

A small **SMART**BOX sensor package fitted to legacy equipment or integrated into new compressors gathers data around a broad range of parameters such as run hours, temperature, and oil levels.

How long does it take to install?

For retrofit applications, where **SMART**LINK hasn't come built-in, installation of the **SMART**BOX can be completed within a couple of hours. On new compressors, it comes as standard.

What happens to the data?

It is transmitted wirelessly, or via ethernet, to a central server, where it is analysed and presented via a simple customer dashboard, highlighting information on 'events,' such as potential failure/pressure drops/ required maintenance.

What happens if you want to monitor the data locally?

The **SMART**VIEW visualization and monitoring solution has been developed for customers who do not want their data transferred outside of their own network, with machines connected over CAN.

How has **SMART**LINK been developed over time?

Most recently, an easy-to-install **SMART**CLAMP solution was introduced for compressors rated up to 30 kW. Here, no extra energy source is needed for operation, as it is simply attached to the incoming power cord to harvest energy from the machine while it is running.

How connected compressors deliver customer benefit

We have seen that connected compressors can be quickly and easily integrated into an intelligent production environment. But the collection and analysis of data only derive value when the information is used in a meaningful way. With **SMART**LINK, three levels of service are available, determined by the amount of information that is required:

SMARTLINK SERVICE:

More than 30 data points are actively monitored via **SMART**LINK, providing insight into the health of the compressor by tracking all its vital signs. This information helps ensure that machines are kept in good condition, supporting the delivery of on-time service, the scheduling of planned visits and the creation of service reports. By sharing this information with Atlas Copco, recommendations for performance enhancement can be made, along with general suggestions and advice. With a Total Responsibility Service Plan, Atlas Copco can take complete care of a customer's compressed air equipment – providing on-time maintenance by service experts, genuine parts, upgrades, overhauls, and full risk coverage. It all contributes to optimal machine health, reduced costs and, ultimately, peace of mind.

SMARTLINK UPTIME:

The sudden breakdown of equipment and machinery can result in lost production and reduced profitability. Having an early warning of potential problems such as low oil or poor dryer quality encourages a fast response, enabling customers to take action, and keep things running as planned. **SMART**LINK provides early warnings through alerts sent to computer or smartphone. With a range of service plans available, Atlas Copco can also proactively address the problem. Meanwhile, integrated bearing condition monitoring delivered through the shock pulse monitoring option keeps an eye on critical components, warning when they need to be replaced. Taking this informed approach to maintenance delivers maximum availability of machines, increasing customer uptime by at least 3%.

SMARTLINK ENERGY:

With compressed air accounting for a significant percentage of energy consumption within industrial facilities, the ability to analyse and optimise the energy efficiency of equipment is an important consideration. **SMART**LINK provides a range of information on energy consumption – from quick overviews on the dashboard or the ability to delve deeper for customised reports. Based on smart algorithms and expert analysis from Atlas Copco specialists, proactive troubleshooting can be deployed to keep energy efficiency at an optimal level, encouraging the spotting and fixing of any deviations at an early stage. This level of information enables customers to save up to 30 per cent with improved energy efficiency, and it can act as a powerful means of complying with certification like ISO50001.

How can **SMART**LINK data be accessed:

Operational data, recommendations, alerts, service timeline and more are available via the all-in **SMART**LINK connectivity platform which is accessible on a computer or smartphone. It allows subscribers to monitor, analyse and optimise their installation's operational performance anytime and from anywhere. A recent addition is the AIRLINK customisable mobile app which provides quick and easy access to compressor information, along with air compressor manuals and service history, and the ability to book a visit by a service technician. Push notifications allow customers to keep compressed air systems in optimal conditions. Any Atlas Copco machine can be added by serial number. Machines do not have to be networked to access all available information – although connection via the **SMART**LINK cloud provides the best experience.

SMARTLINK in action – real-life customer applications

SMARTLINK is a proven technology that has been used by thousands of end-users in a broad range of industrial markets. In many cases, the foresight it has provided has helped avert serious consequences, ranging from equipment breakdown to over-heating and potential fire.

Here is a selection of real-world customer applications.

Potential £6 million fire avoided at waste disposal and recycling company.

A shutdown event on motor overload occurred on one of the GA90 variable speed drive compressors at a waste disposal and recycling company. The diagnostics team monitored the event and issued a notification ticket on the same day. An Atlas Copco technician visited the customer site to investigate the issue and found a loose connection at an incoming isolator. This was causing isolator burn and loss of one phase. The customer was about to recommission the plant after a £6 million fire which was potentially prevented from possibly happening again.

Data patterns give away high-temperature clues at a semiconductor plant.

By analysing **SMART**LINK data over time at a semiconductor manufacturer, temperature readings of the element on an older compressor were consistently high. This pointed to the element becoming inefficient with age. The customer is now considering overhauling the old element, whilst the Atlas Copco service team keeps a close eye on the compressor data, to ensure there is no downtime on site.

Frozen condensate drains could have led to £80,000 breakdown cost.

A cold snap was causing a cereal manufacturer's compressors to run at a particularly low ambient temperature. However, **SMART**LINK picked up warnings from the units' electronic condensate drains, triggering a visit to the site by a service engineer. This early intervention saw the customer fit temporary heaters, thus avoiding the drains freezing up, which could have led to compressor element damage and condensate reaching the air network. Breakdown costs of around £80,000 were therefore averted.

Dryer repair stops food manufacturer from getting in a jam.

SMARTLINK identified a high dewpoint temperature on a dryer at a jam-maker. An Atlas Copco system administrator immediately asked for a service engineer to be sent to the site to see what was happening. It turned out that there was a fault on the dryer, which the engineer was quickly able to repair. Wet air being passed into the jam-making process could have caused production problems, which were averted by **SMART**LINK's intervention.

What next for connected compressors?

This is a top-line view of how connected compressors can provide unprecedented levels of insight for plant engineers, driving operational improvements and reducing costs.

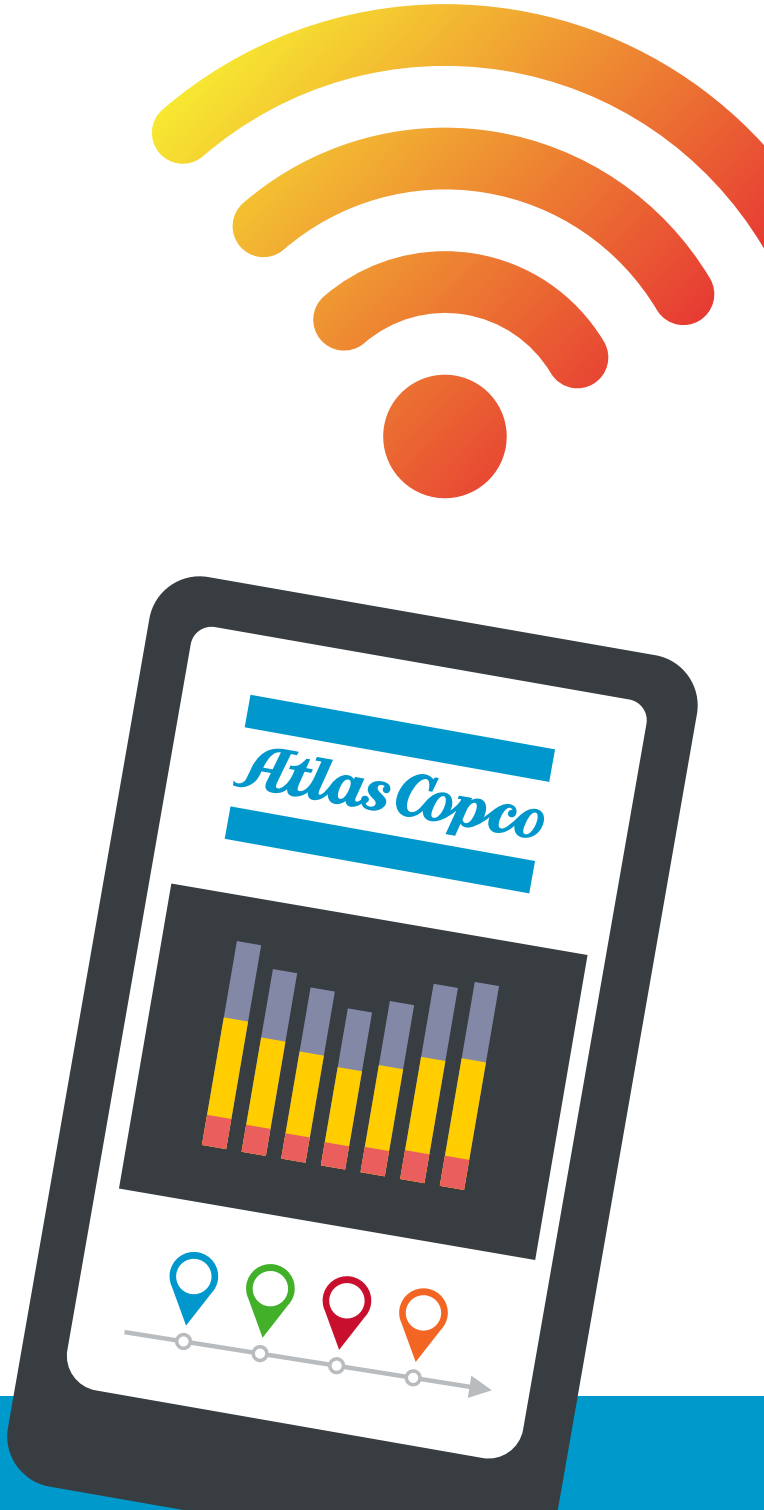
Indeed, solutions such as **SMART**LINK are having a transformative effect on industry. Atlas Copco has around 200,000 connected compressors operating at more than 100,000 customer sites in the world, delivering more than 150 data measurements per second.

The widespread adoption of the technology enables engineers to implement more predictive maintenance methodologies – where customisable data solutions are used to track patterns, identify anomalies, and organise a response, before a problem arises.

Looking into the future, the continued application of connectivity and remote condition monitoring technology within compressed air equipment offers scope for further adoption and opportunities for the IIoT to enhance best practice. This could ultimately lead to a situation where compressed air systems operate independently as cyber-physical systems, making autonomous adjustments to pressure and flow to facilitate process improvements.

This capability will not eliminate the role of the compressor operator, however. There will still be a vital position for humans in the loop, acting as an interface between compressors and the wider smart factory environment.

Ultimately, increased automation in manufacturing will not lead to the loss of employment opportunities, but it will create new and exciting roles.



Get in touch – start your digital journey today

To find out more about how connected compressors can deliver significant benefits to your organisation, contact an Atlas Copco specialist today. There are different levels of **SMART**LINK available - some of which are free – as well as free trials, depending on your individual requirements.

To contact us and get connected, either:
Call: 0800 6050630 **Email:** serviceGB.web@uk.atlascopco.com

Or visit our dedicated SMARTLINK **website:**
https://www.atlascopco.com/en-uk/compressors/service/efficiency/smartlink

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