

Industrial Internet of Things

What is it?

The Internet of Things (IoT) describes physical devices that are connected so they can collect and share information.

Industrial IoT (IIoT) applies this idea to manufacturing. Sensors and other connected devices can be added to machines, equipment, products or working environments to capture real-time information such as temperature, vibration, pressure, energy use, location or performance.

This gives manufacturers greater visibility of their operations and can prompt action, such as identifying maintenance or recalibration needs, switching off equipment to save energy, or responding to a safety issue. By connecting machines, equipment and sensors in this way, IIoT can help improve productivity, quality and efficiency.

IIoT is a key enabler of Industry 4.0 and is often combined with other digital technologies, such as data analytics, artificial intelligence (AI) and automation, to provide greater insight and support informed decision-making.

You don't need a fully connected smart factory to get started. IIoT can begin with a single machine, process or business challenge.

Why it matters

Manufacturers rely on machines, equipment and processes every day, but without the right information it can be difficult to know exactly how they are performing.



Data may be collected manually, checked periodically or remain locked inside individual machines. This can make it harder to understand what is happening across production or identify problems before they have an impact.

IIoT gives manufacturers greater visibility by capturing and sharing information from the physical operation, often in real time. Instead of relying on periodic checks or assumptions, teams can see what is happening and have better information to act on.

For example, vibration sensors fitted to a machine can alert operators to abnormal conditions, allowing them to investigate and take action before they lead to a breakdown.

What it enables

Better visibility of machines, processes and other physical assets can help manufacturers:



Increase productivity – Identify inefficiencies, reduce disruption and make better use of equipment and people.



Improve quality – Spot variations in processes and conditions that could affect production.



Reduce downtime – Identify changes or warning signs that could indicate equipment problems.



Reduce costs and waste – Better understand where time, materials and energy are being used.



Improve sustainability – Monitor energy and resource use and identify opportunities for improvement.



Develop new services – Use connected products and equipment to support remote monitoring, maintenance and customer services.



Case study snapshots



"With full visibility we can now more intelligently manage production and add to the bottom line."

Eco-friendly cleaning product maker Organica UK introduced IIoT sensors across its blending tanks and filling lines to monitor production in real time. The project has increased productivity by 20%, while improving yields and machine uptime and reducing unnecessary maintenance stops.

Where it works

IIoT can be used wherever manufacturers need greater visibility of machines, processes, products or their operating environment.

Machine monitoring

Track performance, utilisation and operating conditions to understand how equipment is being used.

Predictive maintenance

Monitor factors such as vibration or temperature to identify signs of wear or potential failure before breakdowns occur.

Process and quality monitoring

Track production conditions and identify changes that could affect consistency, quality or waste.

Energy and environmental monitoring

Measure energy use, temperature, humidity and other conditions to identify opportunities for improvement.

Asset and product tracking

Monitor the location, condition or movement of materials, components, equipment and finished products.

Connected products and services

Monitor products or equipment remotely once they leave the factory, supporting servicing, maintenance and new customer services.

How it works in practice

IIoT connects the physical world of manufacturing with digital systems. While solutions vary, they typically involve a few key stages:

- ➔ **Sense** – Sensors or connected devices capture information such as temperature, vibration, pressure, energy use or machine status.
- ➔ **Connect** – Wired or wireless networks transmit the data, sometimes using a gateway to connect equipment. This can bring together operational technology (OT), such as machines and control systems, with information technology (IT), such as software and business systems.
- ➔ **Collect** – Data is brought into an IIoT platform, business system or cloud-based service where it can be stored and accessed.
- ➔ **Understand** – Dashboards, alerts and analytics help turn the data into useful information. Some solutions process data close to the machine, known as edge computing.
- ➔ **Act** – People or connected systems use the information to respond, make decisions or trigger actions.

Solutions can range from a single sensor monitoring an existing machine to connected devices operating across an entire factory or supply chain.

Case study snapshots

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“This investment has allowed us to move forward with a greener, more efficient and cost-effective drying process.”

Logs Direct invested in a real-time kiln monitoring and heat-recovery system, using sensors to monitor moisture levels and optimise drying. The technology has cut average drying times from 14 days to seven, doubling capacity, while improving drying accuracy and supporting 15% turnover growth and five new jobs.

Key considerations

Before investing in IIoT, consider what you need to measure, how the information will be used and how the technology will fit with your existing operation.

- **Start with the problem** – Identify the business challenge first, then decide what information you need to address it.
- **Use what you have** – Older machinery can often be connected using sensors, so replacement may not be necessary.
- **Connectivity and compatibility** – Consider how devices will work with existing IT, OT and business systems, and whether the solution can scale.
- **Data quality** – Make sure you are capturing reliable, useful data at the right frequency and level of detail.
- **Cybersecurity** – Connecting equipment creates new routes into operational systems, so security should be built in from the outset.
- **People and skills** – Involve those who understand the process and build the skills needed to use the technology effectively.

Common pitfalls to avoid

- **Starting with the technology** – Focus on the business problem first.
- **Collecting data without purpose** – Know what information you need and why.
- **Connecting everything at once** – Start small, test and scale what works.
- **Creating new silos** – Make sure devices can work with existing technology.
- **Ignoring cybersecurity** – Protect connected equipment and data from the outset.
- **Leaving people behind** – Involve employees and build the skills needed.

6 steps to success and how Made Smarter can help

1

Identify the opportunity – Start with a clear business challenge or area for improvement, such as downtime, energy use, quality or limited visibility. This helps identify where IIoT could add practical value.

MADE SMARTER SUPPORT:
Digital Transformation Workshop

2

Align with business goals – Ensure the opportunity supports wider priorities such as productivity, cost reduction, quality, sustainability or growth.

MADE SMARTER SUPPORT:
Digital roadmap development

3

Explore and test – Assess what needs to be measured, existing equipment and connectivity, and trial sensors or connected devices before making larger investments.

MADE SMARTER SUPPORT:
Technology Adoption Specialist (TAS), Digital Internship and proof-of-concept support

4

Build skills and confidence – Involve employees and develop the knowledge and capability needed to use IIoT effectively.

MADE SMARTER SUPPORT:
Leadership and Digital Champions programmes

5

Develop a business case – Understand the potential benefits, costs, practical requirements and operational impact before investing.

MADE SMARTER SUPPORT:
TAS support, Grant funding application

6

Invest and scale – Implement the solution, measure its impact and expand what works across machines, processes or the wider business.

MADE SMARTER SUPPORT:
Grant funding

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Take the next step

Start your digital journey today. Register for support and speak to a Made Smarter adviser to explore how IIoT could support your business.