

WHAT IS THE INTERNET OF THINGS?

WHAT DOES IT MEAN FOR YOUR BUSINESS?

The Internet of Things (IoT) is a popular phrase for the increasing development and market saturation of Internet-capable physical objects such as appliances and control systems. This 'Internet of Everything' is already revolutionizing industrial processing, product design and transport logistics in every industry. The goal is for our everyday working world to function with the responsiveness and customizability that we already take for granted as part of our online experience. In this brief overview the Application Specialists at **CAS DataLoggers** cover several industry opportunities presented by today's wireless data loggers including models with new mobile apps which let users monitor temperatures and control processes from any location.

With several advances in hardware and network standards, wireless technology has become affordable and compact enough that low-power processors are now in widespread use. This movement toward interconnectedness is most clearly seen in smartphones, which incorporate sensors giving users access to many kinds of data such as GPS, motion, direction and more. Mobile apps use this connectivity to control climate control systems, light fixtures and all manner of electric devices. Smart homes already allow residents to control their appliances and save energy. Soon everything around us may be controlled with just a few taps on a screen anywhere, anytime.

These commercial advances are being matched in a large variety of industrial applications so that factory and plant processes become more reliable, efficient and cost-effective every day. Manufacturers of all kinds are finding ways to integrate wireless sensors into their products for easy network access. As a result it's likely that nearly everything will be online and accessible by mobile phones over Wi-Fi. All these sensors are producing a large amount of data which businesses and organizations can view in real time to optimize product storage, process automation/control and more.

Now that wireless data loggers are affordable on a wide scale, business owners and managers are realizing the savings to be had from switching from manual measurement. Here are just a few examples:

Cold Chain/Transport/Logistics:

In these shipping and storage applications, temperature-sensitive products are tightly managed and tracked using wireless data loggers. In this way it's easy for suppliers to deliver products and also show proof (temperature data) to receivers as proof of regulatory best practices. This simple setup is an affordable way to protect product and seller reputation.

Wireless cold chain data loggers with software tracking capabilities form sophisticated solutions for these applications, sending temperature and humidity data and alarms over email. Some models also offer cloud-based data storage and viewing so that the whole process can be closely monitored.

Fleet monitoring is another increasingly common wireless application, using vehicle data loggers to log data from GPS sensors. This can save substantial logistics costs by reducing wasted fuel and products.

Manufacturing Automation/Control:

Thanks to Internet-capable sensors, process automation is reaching a higher level of efficiency and precision. Today's data loggers and data acquisition systems can now feed data and commands into PLCs and SCADA systems at every step of the process to improve efficiency and product quality at lower costs. For example, users can automatically setup a DAQ system program to automatically control process temperature (for a water tank, oven, machine etc.), to optimize a production line, or to add a precise amount of chemical in an ideal time window.

Wireless temperature and pressure sensor arrays can also be used preventatively to avoid delays or wear on machining equipment. Not only do these automated setups increase measurement accuracy and product quality but they also keep product loss to a minimum and free up workers for other tasks, further increasing productivity.

Agricultural/Environmental:

Weather stations can transmit real-time environmental data to give farmers, agricultural companies and research organizations the most accurate view of microclimates under study. Soil moisture is an especially important factor in many agricultural applications, and wireless sensors now make it easy to collect real time data over many monitoring points and send it to a wireless gateway. Similarly, greenhouse owners are adopting this

wireless technology to find the blind zones in their climate control systems and to remove moldy specimens before losing more product. Likewise, animal husbandry and research applications are also evolving with the development of mobile apps enabling farmers and keepers to quickly check the health of livestock and zoo animals.

For indoor applications, environmental temperature monitoring is becoming commonplace in schools, offices and data centers. These applications are often focused on temperature, humidity, and carbon dioxide monitoring, which are crucial parameters in HVAC performance validation.

Automotive & Aerospace:

Automotive applications already heavily rely on sensor monitoring in manufacturing and testing, for example using CANBus (Controller Area Network), a communications protocol used widely in on-board diagnostics. In a given model, the transmission has its own network, as does the steering column, probably the engine etc. In a typical emissions monitoring application, a data logger records engine oil temperature via thermocouple sensors and sends the data sent to a central computer to analyze the data.

Today's aerospace applications are equally sensor-dependent, often utilizing powerful data acquisition systems monitoring many different parameters. This ranges from recording pressure spikes in military aircraft, vibration monitoring in turbochargers and turbo aero engines, and more.

These sensor-networked applications provide a good example of how the Internet of Things is extending throughout industrial manufacturing to automate data collection and reduce operating costs.

Healthcare and Life Science:

Wireless technology is one of the driving forces behind several exciting advances in healthcare and life science applications. Skin temperature sensors and data links allow hospital and clinic staff to continually monitor patient health, while surgical and sanitary cleanrooms are made more secure thanks to pressure monitoring and alarm systems. Staff can also get an alarm or phone call when their medical fridges fail and pose a risk to temperature-sensitive products. Some systems even offer users cloud storage which enables real-time viewing by multiple parties at once.

Medical laboratories are also making use of the new wireless monitoring technology to replace their aging chart recorders and centralize data collection for later analysis. This way, R&D labs and educators can all stay on the same page regardless of department.

Mobile Apps for Remote Data Accessibility:

With the near-universal presence of smartphones in consumer and industrial markets, now many dataloggers have mobile applications allowing users to view and download data collected from remote sensors, say machine or product temperature in a processing plant. Whether it's current/voltage, runtime, temperature/humidity, or any other value, users are finding it cheaper and easier to keep tabs on their data whether they're in the field or outside work hours. **DT-Remote** by Pacific Data Systems, developed for **dataTaker** data loggers, is a popular app enabling configuration and real-time viewing using dashboard displays of dials and graphs.

Summary:

The Internet of Things is slowly coming online with the help of consumers, industrial users and developers alike. Real-time information is already providing greater transparency and accuracy to just about any application where users are looking for ways to reduce both costs and waste. Process automation is making well-publicized gains every day which shape the way new products are designed and made, but individual users are also able to take advantage of this exciting new technology whether at their jobs or homes.