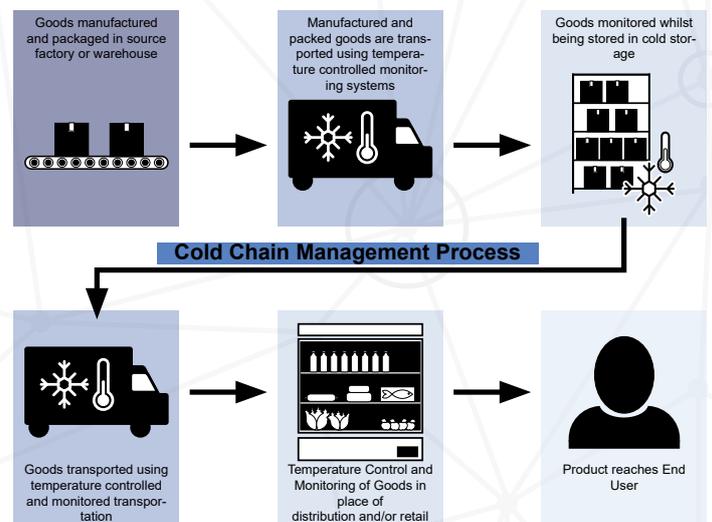# Cold Chain Management

Introduction

Synertech specialises in the design, development, installation and support of innovative technologies and customised solutions that enable clients to guarantee the security and cost-effective management of all assets – from capital goods and equipment to production output and stock.

This commitment, which is based on industry leadership in radio frequency identification technology, has been further enhanced with the availability of an integrated solution that addresses environmental temperature monitoring in processing facilties that produce a comprehensive range of fresh agricultural produce, such as frozen foods, meat and poultry, dairy products and seafood, as well as products in other sectors such as chemicals and pharmaceuticals.

Organisations are accountable to demonstrate contractual and regulatory compliance for the tracking and monitoring of temperature sensitive items throughout the manufacturing and delivery supply chain. It is important to identify and immediately rectify exceptions, so that non-compliance and wastage are reduced to the minimum and ultimately eliminated from the cold storage logistics and value chain.

Traxsense

Synertech's Traxsense software platform brings to life innovative, automated monitoring and tracking solutions by providing clients with dashboards and analytics to easily track all assets and to monitor business performance indicators. Smart sensor enabled assets are transformed into intelligent data sources. These smart assets are connected in real-time which provides organisations with controlled and auditable IOT information. Traxsense not only provides for immediate management decisions, it also harnesses the power of data analytics for business optimisation.

Cold Chain Management Process

Goods manufactured and packaged in source factory or warehouse	Manufactured and packed goods are transported using temperature controlled monitoring systems	Goods monitored whilst being stored in cold storage
Goods transported using temperature controlled and monitored transportation	Temperature Control and Monitoring of Goods in place of distribution and/or retail	Product reaches End User

Background

Strict adherence to the highest possible quality assurance standards as well as compliance with public health and safety legislation is a non-negotiable condition placed on all companies involved in the production of chilled perishable products as well as a wide range of chemicals and pharmaceutical products such as drugs.

These standards are not only imposed by authorities concerned with ensuring that production output is safe for human consumption or use, but also by all stakeholders throughout the entire supply chain – from distributors, retailers and dispensaries through to the end user.

One of the most important aspects of compliance with good manufacturing practice (GMP) and the ability to successfully conform to quality assurance standards is the effective and constant monitoring of temperatures throughout the production process.

In most food, chemical and pharmaceutical processing facilities around the world, regulations and supplier contracts make temperature monitoring a mandatory condition of production. And in terms of GMP regulations in many counties, temperature

monitoring logs have to be kept on file for up to three years.

Exposure to temperatures outside of acceptable parameters or a prescribed range in the production process can degrade the product to the point where it becomes a threat to life or a shortened shelf life. The consequences of failure to adhere to prescribed standards can result in cancelled contracts, heavy penalties in terms of legislation, reputational damage and presents massive financial risk.


Industrial Refrigeration Monitoring

Business Benefits at a Glance

The Synertech temperature monitoring system delivers an unprecedented quality of service and business value. Benefits include:

- **Enhanced compliance and risk management** - A system that conforms to specific ISO standards that govern international occupational health and safety management system specifications (OHSAS), environmental standards and food safety management specifications. Certification according to these and other standards provides highly-valued assurances of quality control and product integrity in support of supplier contracts and risk management in areas of corporate governance and legislative compliance.
- **Unrestricted access to data** - The ability to provide completely objective and consistently reliable data that can be accessed by authorised users via the web from anywhere in the world on virtually any digital device on a 24/7 basis.
- **Objective and reliable data** - The provision of data that is not only totally independent of any other source of information, but that is highly automated in terms of alarms and alerts in order to rule out human error associated with physical monitoring by personnel on the factory floor or on control panels attached to equipment. This capability provides a level of back-up and redundancy that is unrivalled in many other areas of production.
- **High level of customisation** - A system that is quickly and easily designed and customised to meet the exact requirements of virtually any production or processing environment that requires constant monitoring of temperatures throughout the facility. This capability helps to guarantee that no compromises are imposed on compliance with various standards and that the solution can be implemented without any undue delays attributable to factors such as dependencies on other suppliers etc.
- **Unrivalled cost benefits** - The system has proven to be able to guarantee value at a level that is more than double any comparable return on investment achieved by similar IT solutions.
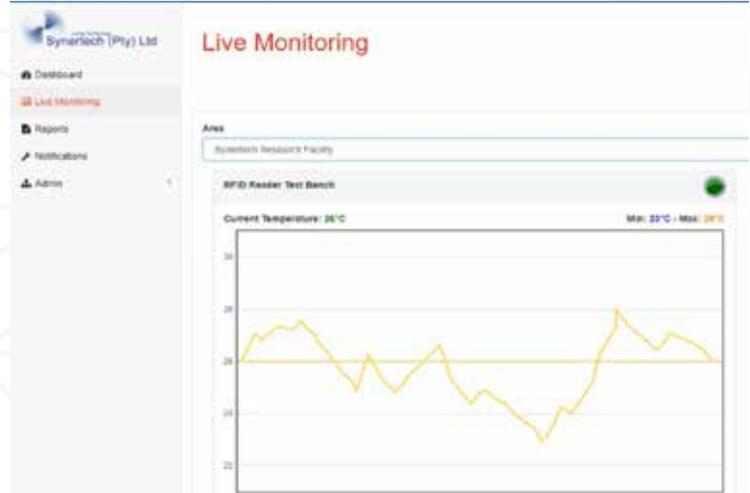
Trend Monitoring

Business Drivers

The monitoring and control of temperature throughout a production environment focused on chilled products or prescribed production conditions can be an extremely complex and challenging problem. Not only is it dependent on basic infrastructure such as the design of a building, but it is also subjected to the reliability and performance of a wide range of equipment such as air conditioners and machinery used in the manufacturing process.

Temperature can also be impacted by workflow processes that involve issues such as access control based on the movement of people and products through the facility during various stages in the production process.

Complexity includes the monitoring and management of a range of ambient operating temperatures in a number of sectors within a single facility. Depending on the production process and the product, multiple prescribed operating temperatures may need to be set for various rooms or parts of a facility. These temperatures can vary from -40°C to +80°C.


Pre-installation Testing

Key Features at a Glance

The innovative Synertech temperature monitoring solution offers the following features in an integrated system that can be designed and customised to address specific operating requirements within any production facility:

- **Live temperature monitoring** - based on world-class components, such as temperature data loggers that conform to the highest possible international standards, the solution is capable of recording temperatures from - 55°C to +100°C across multiple locations throughout a production facility. Based on the client's operating policies and procedures, business rules and production requirements, the system will monitor temperatures against defined or prescribed parameters that can be set according to user-defined or standard specific sampling periods or temperature tolerances

- **Reporting service** - The reporting service captures the raw data received from the temperature data loggers and other sampling sources and converts it into easily read information that is made available in real time for monitoring, evaluation and management purposes. How the monitoring information is presented can be user defined such as an overview of the entire plant, by specific area, as actual temperatures or as a graph etc. In addition to the presentation of readable data in an easily read dashboard, the reporting system serves as a key management tool to review historic data. Any report can be drawn up based on the type of information required from the information stored in the database. All reports can be filtered, e-mailed and printed

- **Alerts and notifications** - The system has the ability to notify operators and key personnel when the temperature in any part of the facility shows any fluctuation (up or down) against parameters defined by production requirements. Alerts are sent out via SMS, e-mail or both based on defined roles and responsibilities, escalation procedures and other critical control business rules

- **System management** - This module provides the interface for management to administer the temperature monitoring system according to a wide range of user-defined parameters from deciding who has access to the system and what parts of the system they have access to, through to the ability to configure critical control parameters in various parts of the facility and across the factory, to the setup of alerts and notifications

- **Communications and connectivity** - The temperature monitoring system provides all authorised users with seamless, continuous access to critical data and reports. This is achieved by leveraging the client's installed IT infrastructure at the production facility, including the local area network and internet access along with GSM and WiFi facilities. When appropriate, Synertech will supplement this infrastructure with back up and other systems to help guarantee redundancy so that critical data is available regardless of any other conditions that may pertain at any given time

- **Compatibility and industry standards** - The monitoring system is delivered to all user platforms – desktop PCs, notebooks/laptops, tablet PCs and Smart Phones via the web interface that is operating system independent and that accommodates all mainstream web browsers. Software components of the monitoring solution have been developed on the Microsoft platform using the very latest programming language and current versions of the Microsoft SQL database. Interfaces into all other industry-standard databases are provided for seamless integration with other client applications such as ERP and stock management systems etc.
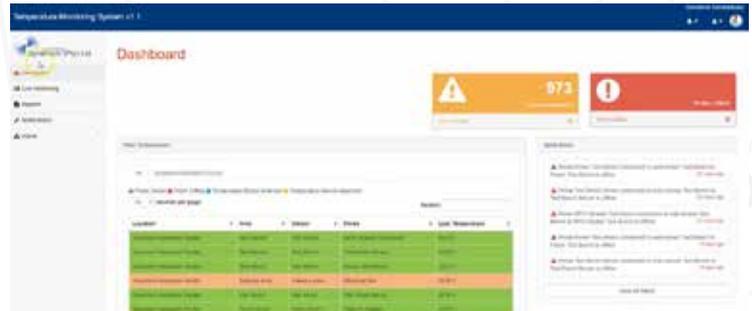
Dashboard Monitoring

After-Sales Service

- **Warranty** – All systems are backed by a 12-month warranty on materials and workmanship commencing from date of delivery
- **Maintenance and support** - A range of technical support and maintenance options are available based on formal service level agreements
- **Training** - Various training options are available ranging from comprehensive classroom training to on-the job training. All systems are provided with training documentation

Summary

Designed, developed and implemented by Synertech, a proudly South African company with more than two decades of success at the forefront of supplying innovative technological solutions to clients across a broad range of industry sectors, the temperature monitoring system offers unprecedented value in a manufacturing and processing sector that requires strict adherence to the highest possible international health and safety standards.

Not only does the system meet these requirements, but it is also supported by a commitment to provide the highest possible levels of client satisfaction in terms of product warranties, technical support and maintenance, user training and the back-up of an ongoing programme of research and development.