

ARTIQ^{COOL} Remote Monitoring of reefer containers

Get long distance
control with ARTIQ^{COOL}

- at any time
- from anywhere
(both on land and at sea)



The ARTIQ^{COOL} Remote Monitoring is a system that brings long distance control of your reefer containers and vessel fleet. Supervising reefer goods and cooling machinery on both land and on sea, it is a powerful tool for quality assurance of sensitive transports. The system may be specially adapted your needs with a dedicated company profile and special functionality.

The ARTIQ^{COOL} is a tool to improve your business efficiency:

- Enhance quality assurance in uninterrupted cold chains
- Supervise environmental control in cooled containers and cargo holds
- Act urgently on needed changes in set points during transport
- Get fast and secure management of claims



The ARTIQ^{COOL} Online System is a product to be used for remote control, monitoring and surveillance of sensitive goods in refrigerated containers both on land and on container vessel. The system is prepared to monitor and store environmental data, position data as well as alarms and other important events. It is also easily customized on customers' request.

By using the system you may improve the quality in your uninterrupted cold chain, claims management and customer service. It gives possibilities to increase your efficiency and will also give the ship crew a tool for safer and more efficient management of container control.

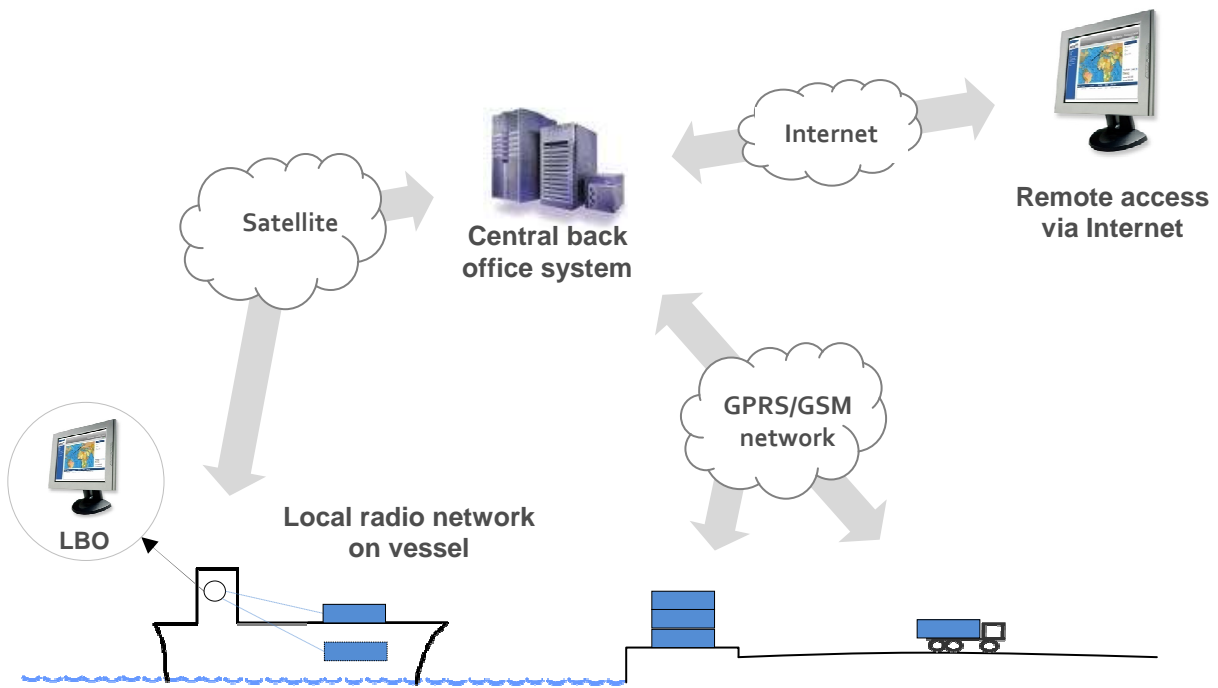
The system also improves your possibility to track your cargo and to implement security solutions in the containers.

Information of current and historical status is presented in a number of user-friendly web reports and is also easily exported to Excel for further analysis.

Since the Online System is web based, all information is easily accessed from any Internet connected computer with a web browser installed. By secure access and user right controls the system prevents intrusions and usage by non-authorized users.

Alarms and reports are sent as SMS or E-mail reports.

Business information may also be exchanged by direct data exchange with existing systems such as ERP systems.



How it works:

The ARTIQ^{COOL} remote monitoring system ensures that the containers are under continuous supervision at all times, independent on whether they are on land, or at sea.

At sea: Reefer containers (located both under and over deck on the container vessels) communicate with the Artic Cool local back office (LBO) on the bridge through a local radio network. This gives ship crew full control of all reefer containers on their vessel.

Important data from the reefer containers may be forwarded to the central back office system through satellite.

On land: As soon as the reefer containers are unloaded, the containers communicate directly with the back office system through GPRS (data traffic over the GSM network).

The ARTIQ^{COOL} components:

Reefer Data Communication unit (R-DCU) – One R-DCU is installed in each reefer container. The unit fits into a dedicated slot in the Carrier container (Microlink II and III) and collects data like supply temperature, return temperature and set points. In addition, the R-DCU can be configured to receive information from external sensors (temperature, O₂, CO₂, relative humidity, door alarms, etc).

The R-DCU forwards all data to the local back office on the bridge through the WNC local radio solution.



The R-DCU contains a GPS module that detects the geographical position of the reefer container. The positioning data is forwarded to the central back office system together with the measurement data.

The GSM and GPS antennas are attached directly on the R-DCU which enables an easy plug and play installation. If needed, this makes it very easy to move the R-DCU from one reefer container to another.

The DCU contains battery back-up enabling power loss detection and to collect and transmit data even after the power loss.

The Local Back office (LBO) – The local back office is an on-board computer used by the crew to monitor and survey the reefer containers on board. The LBO application gives the crew the ability to accept containers, survey temperature data and react on alarms.

In addition, the LBO is the communication gateway between all the containers on board and the central back office system (CBO) located on land. The communication to land is done through satellite (Iridium or other satellite communication means).

The LBO consists of a computer unit with screen, a communication unit to the local radio network on board the vessel, satellite modem, GPS and antennas.



Local Back Office (PC)

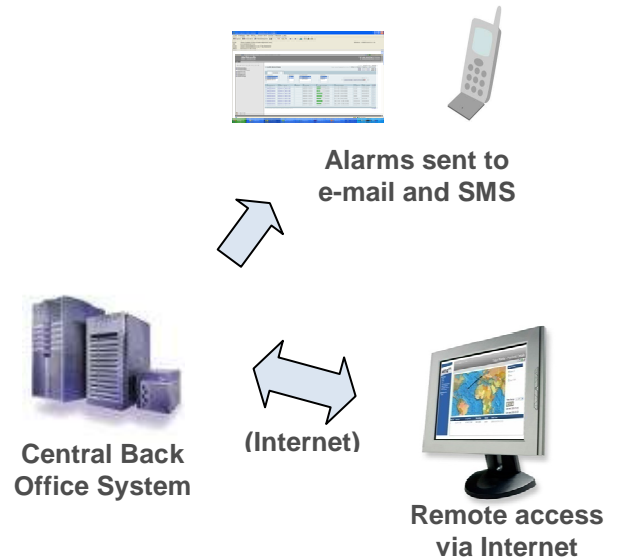
The following functions are available at the LBO:

- Manual and/or automatic acceptance of containers
- System overview
- Container data in tables and graphs
- Events
- Alarm status presentation
- Alarm configuration

The Central Back office (CBO)

The ARTIQ^{COOL} Back Office is the systems data centre storing all the data from the connected containers. It consists of a database with data warehousing functionality, communication gateway solutions, data processing and business logic parts as well as the software for user interfaces and data exchange with other systems.

The user has access to all the functionality provided by the back office through any PC with Internet connection, provided the user has an authorised access id and password.



The CBO offers the following functionality:

Performance management:

- Container overview in table
- Container status in graphs
- Communication status
- Map presentation and tracking
- Alarm overview and details
- Administration

Alarm management:

- Temperature out of range
- Humidity out of range
- Door open
- DCU power loss
- Alarm configuration
- Alarm log
- Forwarding of alarms as e-mails and SMS

Access management:

- Through any Internet browser
- Requires authorized id and password

Administration:

- Define users and user profiles
- Network administration
- Event log



The ARTIQ^{COOL} communication infrastructure

Communication on vessel – local radio network – The communication between the reefer containers and the bridge on the vessel is based on the WNC local radio solution. Each R-DCU installed in the reefer container contains a WNC radio transceiver that communicates with the LBO through license free 433MHz radio links.

The WNC local radio solution is developed to give robust and secure connections in hostile industrial environments, and is well suited container vessels. Bi-directional links, with re-transmission and acknowledgement procedures enables a secure communication to all reefer containers both on and under deck on large 1000 feet container vessels.

There is no traffic cost associated with the WNC local radio network.

Communication from vessel to land – The communication from the LBO to land is done through satellite (Iridium or other satellite communication means).

Communication on land – As soon as a reefer container is unloaded from the vessel, the respective R-DCU activates the integrated GSM/GPRS modem. This enables measurement data to be sent to the CBO on regular intervals (configurable) as long as the reefer container is within GSM coverage.

The R-DCU also has an embedded memory such that collected data can be temporarily stored if no communication network is established (e.g. if the container is left in an area outside GSM coverage). The stored data is sent to the CBO as soon as the container is moved under GSM coverage and the GPRS communication is re-established.