

# GESYSENSE®

## for Mobile Temperature Recording



Fits anywhere

Under the HACCP approach, continuous temperature recording is required for transport of cooling mandatory products such as comestibles and pharmaceutical products (temperature controlled transport). This also applies to the delivery to the consumer. Suitable temperature logging, however, also allows for optimization of the cooling system operation.



### Documentation of temperatures

Record temperature curve during transport

### Control of energy usage

Optimize vehicle cooling during off-times

### Integration into company IT

Receiver with Ethernet connection

### Easy retrofitting

Radio based sensors and actuator in vehicle

In smaller vehicles that also supply the cooling aggregate during operation, longer off-times represent a risk for the cooling system. Vehicles with eutectic accumulator cooling that are only cooled by electric supply without individual regulation are true energy guzzlers.

This can be improved!

The task is clear:

- Continuously record temperatures
- Monitor and control the cooling system
- Optimize energy consumption

For this purpose just some simple things are required:

- Temperature sensors
- Temperature logging and threshold recognition
- Control switch
- Data system integration

### Flexible by Radio

A battery operated, radio based system is available for mobile use, allowing for continuous logging of the temperature development inside the vehicle. At its operational base within radio distance of the receiver data is transmitted wireless to the company's data system.

### Adjustment of the Cooling Cycle

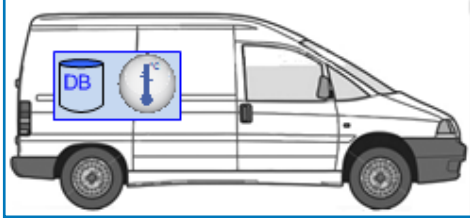
Apart from the control parameter settings received via radio, a local adjustment control including a contactor to switch power supply on and off is required to adjust the cooling process during parking times at night and on weekends. A digital sensor connected to the cooling aggregate can capture those operating times in addition and transmit them wireless as well. Thus the energy needs for the cooling system can be captured allowing for determination of saving potentials related to energy consumption.

The wireless sensor system GESYSENSE by Gesytec provides the appropriate sensor-actuator module SAM 2PT-1D-1R including two PT1000 sensors, a digital input and a switching relay. The GESYSENSE Receiver\LAN is used as receiving station for data transmission from the vehicle and to transmit the control parameters to the module. The PC program GESYSENSE LogIt is available for testing and evaluation purposes. The system can also be easily integrated in other applications.



## System Operation

During the vehicle's delivery tours, the module captures and saves with its two PT1000 probes for example product and indoor temperature or the outdoor temperature. When the vehicle returns to its base facility, the module transmits the logged values via wireless receiver to the data system.



As soon as the vehicle is connected to the supply voltage of the cooling system, the module switches from battery to 24V supply, transmitting this status. The centralized application that not only accepts the logged values now transmits the control parameters and the module autonomously performs the control process. The application provides the option to override the local control process because of superordinate points of view, such as the control of peak and total energy consumption.

During the control process, the module can log the runtime of the cooling unit and transmit it as 15 minutes value. If the vehicle is provided with an energy meter with pulse output, the value for the counting pulses per 15 minutes can be transmitted alternatively. These values are converted to appropriate physical units in the receiver. Due to those features, the system is suitable for energy optimization, especially if several vehicles are connected to the power supply for cooling at the same time.

When the vehicle is disconnected from the supply voltage of the cooling system, the module switches back to battery operation, notifies this status and continues temperature logging.

## Installation and Integration

In the simplest version, the system configuration at a location where the vehicles are cooled consists of a SAM module in the vehicle, a receiver with EIA-485 or Ethernet connection and, for initial tests and evaluation purposes, the PC application software GESYSense LogIt. The data transmitted by the systems can be easily integrated in existing applications.

Inside the vehicle, the GESYSense sensor-actuator module is connected to the cooling system as follows: to 24V supply for operation during parking times and via the module's relay to switch for the supply voltage of the cooling system. In addition it is connected to a digital output of the cooling system that reflects the aggregate status: On/off or error. The two PT 1000 sensors are mounted at the desired metering points inside the vehicle. Then everything is set for efficient control and monitoring of the cooling.

