



# MONITOR YOUR INDUSTRIAL PROCESSES



**FOOD  
HEALTH  
BIOTECHNOLOGY  
CERAMICS  
MANUFACTURING  
METALLURGY  
AERONAUTICS**

...



[www.tmi-orion.com](http://www.tmi-orion.com)

# VALIDATE, MONITOR, CONTROL YOUR PROCESSES



## Validate, monitor, control your industrial processes

**TMI-Orion** has acquired since the introduction of the first pressure and temperature data logger in 1994, a significant know-how in industrial data logging systems.

Innovation and continuous quest for Customer Satisfaction have led to an exceptional portfolio of products. Thanks to our large diversification, most of the industrial needs can be satisfied.

Process validation, by an accountable measurement accuracy and a series of application driven software packages.

Process monitoring, by many measurements in real time thanks to a variety of communication systems (wired, wireless, FM, 2.4 GHz) and physical parameters (temperature, pressure, humidity, air flow, weight, length, and others).

Process control, by using radio transmission to control your process in real time or to transfer your data to any information system.

A flexible and innovative engineering team is constantly designing the best products and solutions for your needs.

## Communication

As with any logger, data need to be downloaded to a PC. TMI-Orion offers real time data reading and/or after the fact downloading.

- Real time data reading is done with the Radio options available on many of our loggers. We offer two transmission modes: FM and 2.4 GHz depending on the models.
- Post-process reading is done through a wired interface on most of our loggers, with the exception of i-VACQ which uses an induction interface.

### 2.4 GHz radio transmission

The new generation of loggers (*NanoVACQ* and *VACQ*) uses 2.4 GHz frequency. They transmit in ISM bandwidth, serve various application fields, including sterilization, freeze-drying, pasteurization or long reach transmissions for industrial ovens. The radio loggers use the technology based on norm IEEE 802.15.4, which enables the management of various loggers in the same space.

In order to meet the needs of a large number of applications, TMI-Orion Radio loggers are equipped with a connectable antenna. A special connector ensures water tightness over a large range of pressure and vacuum. The receiving base station can be connected directly by USB, or using a long distance connection RS485 type, or even using an Ethernet connection. This range of I/O allows integrating the system in complex configurations. Real time data visualization and processing are done with QLEVER, new software by TMI-Orion.

### FM communication

Most of the NanoVACQ, VACQ II and VACQ xFlat are available in FM versions (433 MHz, 915 MHz), which enables real time data transmission and instantaneous process control. We have successfully implemented this solution in humid environments like autoclaves, and at very high temperatures, such as in ceramic ovens.

### Wired interface to the PC

The communication interface with the PC is an electronic device which links the logger to the PC, thus allowing 2-way data transmission to program and read the loggers. Interfaces can be either "single" or "multi" type, and both are available in USB version.

A single logger interface communicates with one logger at a time, and the multi logger interface communicates with 6 loggers simultaneously. You can easily connect several Multi interfaces together in a daisy chain to communicate with up to 96 loggers at a time.



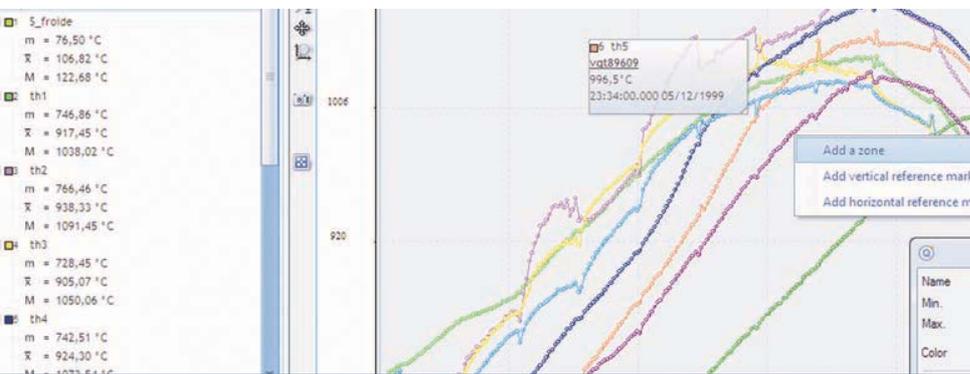
### Contactless communication

TMI-ORION has introduced a new way of contactless communication available on i-VACQ. It enables data reading through a non metallic packaging by simple positioning on top of the interface.

### Process control, link to the web

TMI-Orion is considering any specific need of software development for process control or data transfer and processing through the Web.





# DATA PROCESSING

## Data processing

TMI-Orion has developed specific software to enable optimized reading and processing of your data.

**QLEVER Software** is recommended for general data processing while **xVACQ Pharma** is dedicated to pharmacy industry and **ValiVACQ** is especially designed for hospital use.

### QLEVER

**QLEVER** is an acquisition, analysis and data management software. It enables visualization of measurement raw results, calculations on data, and creation of technical reports.

Customizable, with numerous ergonomics and flexibility features, it is an outstandingly efficient software that is also easy to use.

These are just some of the features you will enjoy:

**File management** : A simple interface enables ergonomic file management, all the calibration files are easily visible with updated time and date

**Configuration** : Configuration menu enables selection of communication ports, selection of measurement units, and calibration file management

**Communication ports** : The available communication ports can be selected with every kind of communication interface.

**Loggers management** : Possibility of using various ports and all kinds of interfaces during the same recording, single window to check validity of calibration files and loggers status, possibility to install a calibration file without leaving the window.

**Programming** : Visualization of logger status, programming and starting of loggers even if others are not ready, possibility of applying different setups (start date, acquisition frequency...) to each logger

**Reading the loggers** : On the same screen graphical, analytical, statistical results Numerous possibilities of graphical analysis (zoom, cursor, limits, scales, etc...), superposition of curves, saving all acquisition points

Easy to use thanks to customizable transparency of the windows

Zoning of schemes

Possibility to calculate on each channel (Vs, F0, A0, Vp, offset, slope, %, ax+b, ...)

### xVACQ PHARMA

FDA 21CFR Part 11 compliant

New IQ/OQ software and hardware qualification protocol

Main software functionalities:

- Audit Trail of all software use.
- Management of user accounts.
- Electronic signature of documents
- Set Up files creation.
- Automatic analysis of the Min / Max / Average performances, stability, homogeneity, F0, etc., on programmable periods.
- Reports edition functionality.

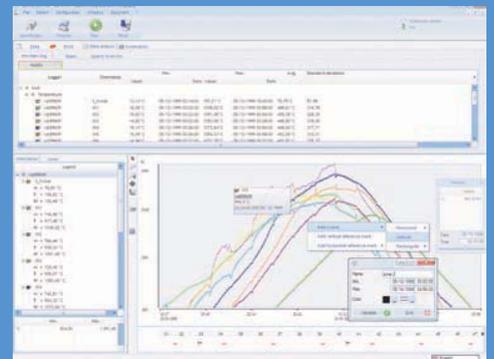
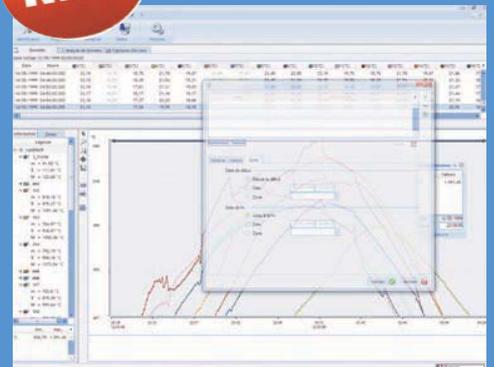
### VALIVACQ

ValiVACQ has been designed for validation of hospital sterilization.

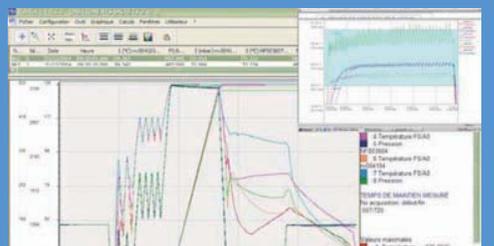
EN554 compliant.

**ValiVACQ** is a validation software enabling reports authoring and editing in compliance with EN554 norm. User friendly and simple to use, it allows a precise analysis of the physical magnitudes measured during the whole cycle.

The autoclave validation is done in three steps: loggers programming, positioning inside the autoclave, reading of the data recorded during the sterilization cycle.



Logger	Temp	Hum	Pressure	Flow	Speed	Position	Angle	Weight
PT100A1	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A2	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A3	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A4	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A5	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A6	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A7	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A8	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A9	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00
PT100A10	100.00	65.00	1013.25	0.00	0.00	0.00	0.00	0.00



# DATA LOGGERS



## Temperature data loggers

With a temperature operating range from  $-80^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ , TMI-Orion offers a solution to most industrial applications. The loggers are watertight at high pressure and designed to be placed inside the processes.

Beyond the operating range, a thermal shield is necessary to measure temperatures between  $-100^{\circ}\text{C}$  and  $+1200^{\circ}\text{C}$ .

Sensors are Pt100, Pt1000 or thermocouples for high temperature data loggers. The probes have various forms and dimensions. They can be internal to the logger, placed at the end of a rigid probe 10 to 125 mm long or at the end of a flexible or semi-rigid probe, up to 1m long. Models from 1 to 16 measurement channels are available.

### MiniVACQ

MiniVACQ is the entry-level product from TMI-Orion. Its miniaturization and technology is equivalent to the other high quality loggers from TMI-Orion.

### PicoVACQ

PicoVACQ is the most miniaturized family of products from TMI-Orion. The latest electronic technologies are used while performances are boosted and dimensions reduced to the smallest possible.

Specially designed for clean industries, all the models of this family enable process validation of food and pharmacy industries. Among the most common applications : sterilization and pasteurization (steam or ethylene oxide), freezer mapping, temperature measurement in microwave ovens.

### NanoVACQ

NanoVACQ (diameter 31 mm, length from 31 to 132 mm) can carry 1, 2 or 3 temperature sensors. The probes of the various standard models can vary in shape or length.

### NanoVACQ Flat

NanoVACQ Flat, with a height of 11 mm, has been designed for low space applications. Various probe lengths and two probe diameters are available. This data logger can be placed at the top of vials, bottle or outside a can with the probe inside.

### NanoVACQ xFlat

NanoVACQ xFlat, 7 mm high, fits all narrow space applications like wood or plasterboard thermal processes.

### VACQ xFlat

With a height from 10 mm, and up to 16 thermocouples, the VACQ xFlat fits all industrial applications that need measuring high temperature at different points. With a thermal shield, it can be used for depyrogenation process, metal curing, kilns and tunnel ovens.

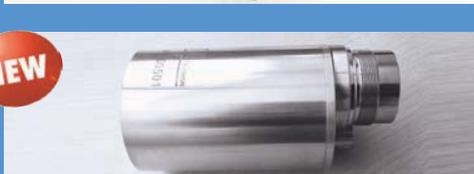
### VACQ III

In its standard version, VACQ III enables temperature measurement inside kilns during ceramics, tiles and bricks curing.

The thermocouple connection head can be adapted to any other industrial application, depending on kilns configurations.

It has 8 or 16 thermocouple channels. VACQ III is a variation of the VACQ II with a new and more compact packaging.

Watertight at high pressure.



# DATA LOGGERS



## DrinkVACQ

DrinkVACQ is especially designed for beverage pasteurization control. The choice of a model depends on your process:

- DrinkVACQ II may enable real time reading of the results by radio transmission, if the transmission is possible.
- With DrinkVACQ III, reading is done at the end of the pasteurization cycle by in situ connection of the logger to a PC tablet.



## Pressure and temperature data loggers

TMI-Orion offers data loggers measuring pressure and temperature simultaneously. They are available in both lines of products: NanoVACQ (31mm diameter) and PicoVACQ (15mm diameter).

Some of these products are available in Ex version. They can measure pressure from 30 mbar absolute to 30 bar, depending on the models.

### PicoVACQ PT

PicoVACQ PT enables measurement of pressure and temperature. While specially designed for food and health care validation applications, it can be used in many other processes. Its very small size makes it very useful for any application where size is a concern.

An Ex version is available.

### NanoVACQ PT

NanoVACQ PT has one pressure sensor and one or two temperature sensors. It has been designed to comply, by its accuracy and response time, with the requirements of the health care industry: hospital and pharmaceutical sterilization.

Many other industries are using this data logger.

Ex versions are available.



## Humidity and temperature data loggers

Humidity and temperature can be measured simultaneously with TMI-Orion data loggers: NanoVACQ (31mm diameter) or PicoVACQ (15mm diameter) line of products.

Some of these products exist in Ex version. They can measure humidity from 5% RH to 95% RH at maximum temperature of 80°C or 140°C, depending on models.

### PicoVACQ HT

PicoVACQ HT enables measurement of humidity and temperature. While specially designed for food and health care validation applications it can be used in many other applications. Its very small size makes it very useful for any application where size is a concern.

An Ex version is available.

### NanoVACQ HT

NanoVACQ HT has one humidity sensor and one or two temperature sensors.

The 80°C version has been designed to comply with the norm of ethylene oxide sterilization. The 140°C version fits many other industries where process temperature is higher.

An Ex version is available.



# DATA LOGGERS



## Shrinkage, humidity and temperature data loggers



### CERIDRY

CeriDRY correlates the variation of relative humidity and air temperature with the shrinkage of bricks, tiles or ceramics while they dry. It also enables the acute evaluation of drying within two parts of the same brick or tile.

An FM radio version enabling real time data transmission is also available.



### High-T-DRY

High-T-Dry correlates the variations of air temperature with the shrinkage of bricks, tiles or ceramics while they dry. It also enables the acute evaluation of drying within two parts of the same brick or tile.

The product has been specifically designed to respond to the high temperature drying processes up to 250°C.

The High-T-Dry is an autonomous logger that includes a remote temperature sensor and a special shrinkage sensor. The NanoVACQ body can be exposed to a temperature of 125°C (257°F). The sensors are placed on a metallic board that can be exposed to higher temperature, up to 250°C.

## Air flow velocity and temperature data logger



### NanoVACQ Ad

NanoVACQ Ad measures air flow velocity and temperature inside dryers and ovens. It is useful for applications such as ceramic drying processes or food cooking.

The wheel air flow sensor is connectable and can be associated with one temperature flexible or rigid temperature probe.

## Rotation data logger

NEW



### PicoVACQ Rotation

A logger, the size of a PicoVACQ (diameter 15 mm), for measuring rotation speed in rotating autoclave.

# DATA LOGGERS



## Weight data loggers

TMI-Orion is offering two families of weight data loggers. In addition, custom designed solutions can be developed for many other industrial applications.

### NanoVACQ Weight

NanoVACQ Weight is a temperature and force data logger with a mechanical structure customized to the needs of the application.

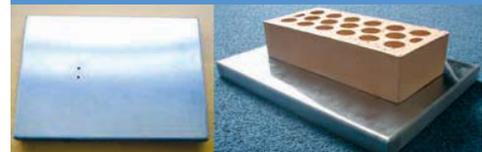
It is especially useful for weighing or measuring constraints created when stacking objects like cans or trays in industrial environments.

1 constraint gauge and 1 or 2 temperature sensors.

### DryBAL

An extra thin scale for use inside drying industrial processes like ceramics.

DryBAL is a few cm high scale able to weigh 5 g variations on a 30 kg full scale, or 1 g on a 5 kg full scale. It is a temperature and weight data logger. Temperature range from 0°C to 140°C. Weight measurement is temperature compensated.



## Packaging deformation data logger

### NanoVACQ Deformation

Measures dimension variations of cans, food containers, sachets or caps during thermal processes, cooking or sterilization.

A positioning kit has to be adapted to the application.

This product is also available in a wired real time mode.

Measure package deformation, temperature and pressure, all in the same profile, in real time.



## Thermal shields

TMI-ORION develops thermal shields, thus providing a significant extension of the loggers operating range.

In addition to a list of standard products, developed for specific needs (applications, temperature profile...), we also consider custom design.

Examples of thermal shields:



# TMI-ORION DATA LOGGERS AND SOFTWARE SOLUTIONS



Data loggers and software solutions to monitor and control your industrial processes



## FOOD

Sterilization  
Pasteurization  
Packaging deformation  
Drying  
Cooking  
Microwave...



## HEALTH – BIOTECHNOLOGY

Steam sterilization  
Ethylene oxide sterilization  
Freeze-drying processes  
Aerosol spray  
Freezer mapping  
Depyrogenation  
Contactless communication  
Washing – Disinfection...



## MANUFACTURING

**High temperatures**  
Heat treatments, annealing, surface treatments, casting

**High tech industry**  
Industrial heating processes, glass, electronics, automotive, aircraft, rubber

**Chemistry and materials**  
Material manufacturing, high pressures, reduced spaces, sprays, autoclaves processes

Ovens and autoclave manufacturing



## CERAMICS

Curing  
Drying – shrinkage, air flow, weight, mapping...

...and many other industrial processes including temperature, pressure, humidity, shrinkage, deformation, air flow velocity, rotation or weight measurement.