

DATA SHEET

TMI-Orion

VACQ III

FullRadio



Real time monitoring of temperature inside kilns during curing processes of bricks, tiles, ceramics.

VACQ III FullRadio is an autonomous data logger which enables the measurement of temperature inside kilns during ceramics, tiles and bricks curing processes. It has 8 or 16 thermocouple channels and is associated with industry- specific software: Qlever Ceramics.

It enables the visualization and mapping of thermocouple temperature inside kilns, and the matching of wagon position and temperature at corresponding location. Positioning the instruments (burner, door...) in the software helps anticipating possible failures.

VACQ III FullRadio is equipped with a 2.4 GHz radio transceiver as the unique communication interface. In addition to its data logger functionalities, it is designed for remote set up and radio data transmission, in real time or afterwards, through a radio modem connected to a PC. The PC is equipped with Qlever platform for logger setup and process data collection, management and display.

METROLOGY

Operating range	Measurement range	Resolution and noise	Uncertainty* The uncertainty corresponds to 2 standard deviations
Without thermal shield : from 0°C to 140°C With thermal shield: from 0°C to 250°C during 70 hours. Other thermal profiles upon request.	Up to 1200°C	16 bit converter, resolution: $< \pm 0.1$ °C	± 0.1 °C from 0°C to +140°C

Each logger can be calibrated and adjusted at the temperature points corresponding to the user's needs.

**The specified uncertainties correspond to two standard deviations. The uncertainties are calculated taking into account the various significant error sources, including the calibration probes, the equipment, the environmental conditions, the influence of the logger, repeatability, etc...*



FUNCTIONS

- Radio set up, start and reading of data
- 2.4 GHz bidirectional radio communication
- Radio transceiver set up: transmission duration and rate (1 per hour to 1 per second)
- Start set up: immediate or delayed
- Real time or post-process radio data transmission
- Time stamped measurement data
- Battery level alert with Qlever software

TECHNICAL SPECIFICATIONS

Material	Logger body: 316L Stainless steel Antennas: PEEK	
Dimensions	D.67 mm x L.100 mm (without connector)	
Number of channels	8	Up to 8 connected thermocouple elements and up to 3 platinum sensors as reference channel for cold junction, and internal temperature of the box
	16	Up to 16 connected thermocouple elements and up to 6 platinum sensors as reference channel for cold junction, and internal temperature of the box
Temperature sensor	Thermocouples: type K (full scale 1300°C)	
Memory capacity	232 000 acquisitions divided by number of measurement channels	
Acquisition rate	Programmable: minimum 1 second, maximum 59 minutes and 59 seconds	
Program duration	Programmable: days, hours, minutes	
Recording	Programmable start: by date, hour, minute	
Power	User replaceable battery pack	
Connectivity	2.4 GHz bidirectional radio modem and embedded 2.4 GHz radio transceiver module	
Connectable antenna models for VACQ III FullRadio (*)	Standard	length 49 mm, medium range - line of sight: 25 meters
	Short	length 25 mm, short range - line of sight: 15 meters
	Long	length 79 mm, long range - line of sight: 30 meters
	Remote	see catalog for accessories and options
External connection box (**)	Number of channels	Adapted to the number of channels of the logger
	Connectors	Miniature, standard or universal (upon request)
	Material	304 Stainless steel for the flexible hose 316L Stainless steel for the box

(*) A preliminary test is recommended to validate the hertzian transmission in the user's application.

(**) We can study any customization of the box: connectors, format, flexible hose length.



VACQ III external connection box



VACQ III



RADIO-FREQUENCY COMMUNICATION

- 2.4 GHz ISM band (frequency range 2.405 GHz to 2.475 GHz) / Can be used without licence / Universal band for industrial, scientific and medical devices with low radio transmission power / Maximum radiating power +5 dBm (3,2 mW).
- Radio transmission range depends on the environment.
- TMI-Orion 2.4 GHz bidirectional radio protocol, based on IEEE 802.15.4 standard / 14 RF channels for the user / Able to manage an unlimited number of equipments connected in star configuration in the same space.
- **VACQ III FullRadio is compliant with the following regulations:** R&TTE Directive 1999/5/CE (EU), FCC Part 15.247 (USA), RSS-210 (Canada), ARIB TELEC (Japan), KCC RWA 58-2 (Korea).

AUTONOMY

The VACQ III FullRadio is powered by a battery pack; its autonomy depends on environment and operational conditions of the application (extreme temperatures, radio range, electromagnetic disturbances, data acquisition and transmission rate).

As a result of the variety of environments and operational conditions, TMI-Orion does not guaranty the battery lifetime and recommends that the user determine the battery lifetime according to his own process conditions and experience.

SOFTWARE AND RELATED PRODUCTS

VACQ III FullRadio is used with Qlever software platform and a 2.4 GHz radio modem for the PC.

Qlever software platform: data acquisition, management and visualization of data from TMI-Orion data loggers. Qlever is installed on a PC and operates under Windows® Vista/7/8/10. Depending on the use of VACQ III, data

transmission and visualization is done in real time or after the fact.

2.4 GHz radio modem for PC: this transmitting device connects to the PC in order to ensure radio link with the VACQ III FullRadio. Several antennas are available to optimize radio communications in the operational environment.

DELIVERABLES

The VACQ III FullRadio solution usually includes the following items:

- The VACQ III FullRadio data logger with a battery pack
- The VACQ III FullRadio calibration certificate
- The VACQ III FullRadio configuration and calibration file
- A 2.4 GHz radio modem for PC (to be ordered separately)
- Qlever software platform (to be ordered separately)
- A transport case (optional – to be ordered separately)

SERVICES

Maintenance: The VACQ III FullRadio is associated with an annual preventative maintenance service for the replacement of o-rings, functional checking, calibration and adjustment.

Accessories: The battery packs, engineered by TMI-Orion, are replaceable by the user and are referenced in our products list.

Headquarters: TMI-Orion S.A.
Parc Bellegarde - Bâtiment A
1, chemin de Borie
34170 Castelnau-le-Lez - France
T.: +33 (0)4 99 52 67 10 – F.: +33 (0)4 99 52 67 19



USA : TMI-USA, Inc.
11491 Sunset Hills Road, Suite 310
Reston, VA 20190 - USA
T : +1 703 668 0114 – F : +1 703 668 0118