TMI-Orion

VACQ III radio

Real time mapping of the thermal profile 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 ceramic, tile and brick curing processes. It has 8 or 16 thermocouple channels and is associated with industry-specific software Qlever Ceramics.

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

The radio function allows real time monitoring and/or recording of the data.

METROLOGY

Operating range	Measurement range	Resolution	Uncertainty of the internal reference channel*
Without thermal shield: from 0°C to 140°C With thermal shield: from 0°C to 250°C during 60 hours. Other thermal profiles upon request.	Up to 1300°C	<±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…

T0/DS/192001.ed1

FUNCTIONS

- 2.4 GHz radio communication
- 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 High temperature antenna: Inconel®	
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 radio transceiver / USB interface for communication with the PC	
Connectable antenna for VACQ III radio (*)	Range: line of sight 25 meters Length: 390 mm or 460 mm	
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 radio body

VACQ III radio external connection box

T0/DS/192001.ed1

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 radiated 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 several pieces of equipment connected in star configuration in the same space.

AUTONOMY

The VACQ III radio is powered by a battery pack; its autonomy depends on environmental 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 radio is used with the Qlever software platform and a TMI-Orion radio transceiver.

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 radio, data transmission and visualization are done in real time or after the fact.

TMI-Orion radio transceiver: this transmitting device connects to the PC or to an RJ-45 LAN drop in order to ensure radio link with the VACQ III radio. The high temperature Inconel antenna optimizes radio communications in the operational environment.

DELIVERABLES

The VACQ III radio solution usually includes the following items:
- VACQ III with batteries,
- The VACQ III external connexion box,
- The logger calibration certificate,
- The logger configuration and calibration file.

Optional, to be ordered separately:
- One or more thermocouple probes with connectors,
- A USB wired interface for PC,
- A TMI-Orion radio transceiver,
- Qlever software and User's guide,
- A transport case.

SERVICES

Maintenance: TMI-Orion recommends annual preventative maintenance and calibration 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 the documentation available on our website.

TO/DS/192001.ed1