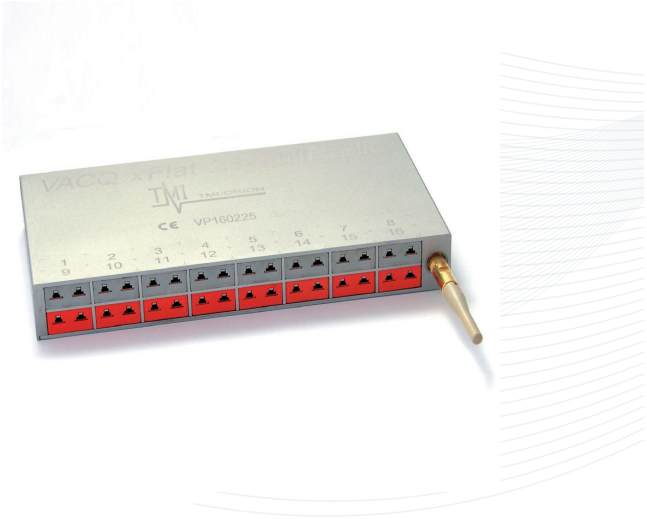
DATA SHEET

TMI-Orion

VACQ xFlat FullRadio



Real time wireless temperature measurement at various points for thermal process control.

The VACQ xFlat FullRadio is an autonomous data logger equipped with 4, 8, 16 or 32 thermocouple connectors. It must be protected by a thermal shield when temperature exceeds +140°C.

The use of the logger with power adapter frees the user from battery lifetime concerns. When required by the application, it is possible to switch to battery mode so the logger is fully autonomous and offers a greater operating range in temperature.

VACQ xFlat 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 after the process, through a TMI-Orion radio transceiver connected to a PC. The PC is equipped with the Qlever software platform for logger setup and process data collection, management and display.

METROLOGY

Models and number of thermocouple channels	Operating range		Measurement range	Resolution	Internal reference channel calibration uncertainties*
VACQ xFlat 1.4 FullRadio 4 channels **VACQ xFlat 1.8 FullRadio** 8 channels **VACQ xFlat 2.8 FullRadio** 16 channels (2 rows of 8)	With AC adapter	0°C to +60°C	Depending on the thermocouple: Type K : 0°C to +1300°C and -200°C to +1300°C Type T : 0°C to +400°C and -230°C to +400°C Type N : 0°C to +1300°C and -150°C to +1300°C Type J : 0°C to +760°C and -200°C to +760°C Type B : +600°C to +1820°C Type E : 0°C to +690°C Type S : 0°C to +1660 °C Type R : 0°C to +1760°C Other measurement range upon request.	<± 0.1°C	± 0.2°C from 0°C to +140°C
	With batteries	-55°C to +140°C			
VACQ xFlat 4.8 FullRadio 32 channels	With AC adapter	0°C to +60°C	Type T: -230°C to +400°C	<± 0.1°C	± 0.2°C from 0°C to +140°C
	With batteries	-55°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…*

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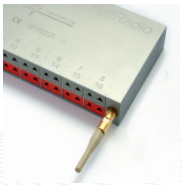

FUNCTIONS

- 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 after the process radio data transmission
- Time stamped measurement data
- Battery level alert with Qlever software

TECHNICAL SPECIFICATIONS

Material of the logger body	Anodized aluminum		
Dimensions of the logger body	VACQ xFlat 1.4 FullRadio, VACQ xFlat 1.8 FullRadio, VACQ xFlat 2.8 FullRadio	L. 150 mm x H.20 mm x W. 80 mm	
	VACQ xFlat 4.8 FullRadio	L.150 mm x H.40 mm x W.80 mm	
Number of channels	4	4 connected thermocouple elements 2 internal reference channels	
	8	8 connected thermocouple elements 2 internal reference channels	
	16	2x8 connected thermocouple elements, 3 internal reference channels	
	32	4x8 connected thermocouple elements, 6 internal reference channels	
Thermocouple connectors	VACQ xFlat 1.4 FullRadio, VACQ xFlat 1.8 FullRadio, VACQ xFlat 2.8 FullRadio	Universal, K or T (other upon request)	
	VACQ xFlat 4.8 FullRadio	Type T (other upon request)	
Temperature sensor	VACQ xFlat 1.4 FullRadio, VACQ xFlat 1.8 FullRadio, VACQ xFlat 2.8 FullRadio	With universal connectors	Type K, T, N, J, B, E, S or R thermocouples
		With type K connectors	Type K thermocouples
		With type T connectors	Type T thermocouples
	VACQ xFlat 4.8 FullRadio	With type T connectors	Type T thermocouples
Memory capacity	VACQ xFlat 1.4 FullRadio	43 600 acquisitions per thermocouple channel	
	VACQ xFlat 1.8 FullRadio	26 100 acquisitions per thermocouple channel	
	VACQ xFlat 2.8 FullRadio	13 700 acquisitions per thermocouple channel	
	VACQ xFlat 4.8 FullRadio	13 700 acquisitions per thermocouple channel	
Watertightness	This logger is not watertight		
Acquisition rate	Programmable: minimum 1 second, maximum 59 minutes and 59 seconds		
Program duration	Programmable: days, hours, minutes		
Recording	Programmable start: by day, hour, minute		

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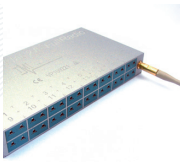


TECHNICAL SPECIFICATIONS

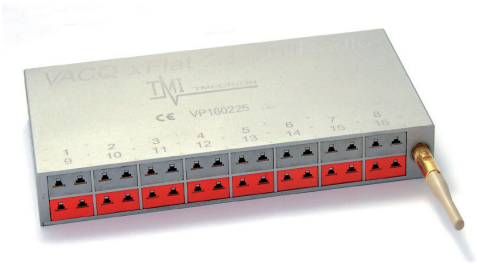
Power	Interchangeable power supply to be used according to the application : AC adapter (+ backup battery pack) / two user replaceable 015S batteries	
Connectivity	2.4 GHz bidirectional radio transceiver and embedded 2.4 GHz radio transceiver module	
Connectable antenna model for VACQ xFlat FullRadio(*)	Standard	length 49 mm, medium range - 25 meters

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

Examples of VACQ xFlat FullRadio models:

VACQ xFlat 2.8 FullRadio with connectors for type K thermocouples.

VACQ xFlat 2.8 FullRadio with connectors for type T thermocouples.



VACQ xFlat 2.8 FullRadio with 8 connectors for type B thermocouples and 8 connectors for type S thermocouples.

RADIO-FREQUENCY COMMUNICATION

- 2.4 GHz ISM band (frequency range 2.405 GHz to 2.475 GHz) / Can be used without license / 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 channel for the user / Able to manage several pieces of equipment connected in star configuration in the same space.

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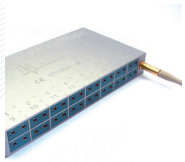

AUTONOMY

The various models of VACQ xFlat FullRadio are powered by an AC adapter or by two 015S batteries. With the batteries, the 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 xFlat FullRadio is used with 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 xFlat FullRadio, data transmission and visualization is done in real time or after the process.

TMI-Orion radio transceiver: this transmitting device connects to the PC in order to ensure radio link with the VACQ xFlat FullRadio. Several antennas are available to optimize radio communications in the operational environment.

VACQ xFlat family of products also includes:

- VACQ xFlat Radio for remote real time reading of data.
- VACQ xFlat (wired).
- VACQ 3000, for laboratory processes, a set of 48 thermocouple channels in a rack easy to store and carry.

DELIVERABLES

The VACQ xFlat FullRadio solution usually includes the following items:

- The VACQ xFlat FullRadio data logger with a battery pack and/or AC block + AC adapter,
- The VACQ xFlat FullRadio calibration certificate,
- The VACQ xFlat FullRadio configuration and calibration file,
- A TMI-Orion radio transceiver (to be ordered separately),
- Qlever software platform (to be ordered separately),
- A transport case (optional – to be ordered separately).

SERVICES

Maintenance: TMI-Orion recommends annual preventative maintenance and calibration service for 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.

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