

# LCT-14 technical Specifications

## Operating method

The Qbit PM (Particulate Matter) measuring system is an instrument based on “Laser Scattering” detection. That is on the light scattered by an air sample (with particulate) that is introduced in a specific optical interaction chamber. This kind of measurement enables to get real time data, or in other words continuous monitoring of PM density in the air. In spite of that the method does not perform a direct measure of PM mass. The amount of scattered light is proportional to the PM concentration in air given a specific kind of particulate and a specific size distribution. The conversion of the optical measurement to a mass amount of PM in air has to be obtained through a referencing process by comparison with a weighting method. The closer the PM sample used in the referencing process is to the PM under test, the more reliable the mass content value obtained in the continuous monitoring will be.

## Operative specifications

Quantity	Value	Unit	Notes
Supply Voltage	24	V <sub>dc</sub>	Equipped with 220 V <sub>ac</sub> &/or batteries
Average Power Consumption	<5	W	For a pump flow equal to 2.2 l/min
Maximum Peak Power Cons.	15	W	During calibration and for a 3 l/min flow
Pump Flow	0-3	l/min	Settable with a precision potentiometer
Measuring time	1-120	sec	SW settable
Calibration interval	1-600	min	SW settable
Measurement string size	64	Byte	
Control Unit			Toshiba Encore Mini WT7-C-100 tablet
HD free space size on Control Unit	~2	GByte	Enables storage of more than 10 <sup>6</sup> Measurements
Duration	Unlimited		With power cord supply (a)
	>15	hours	With 24V/5Ah battery pack
	>24	hours	With 24V/8Ah battery pack

- (a) Our Tablet control unit is power supplied by the instrument thus its internal battery is maintained in charge. In a black-out event the Tablet remains on for 4-5 hours and will start the instrument back again if the line power turns back on.

## Resolution and accuracy of the measurement signals:

Spec	Value	Unit	Notes
PM signal resolution	1/4096	Full Scale	(1)
PM signal accuracy	<1%	Full Scale	On the whole range of measuring times (2)
Maximum PM range	10000	$\mu\text{g}/\text{m}^3$	Factory Settable (3)
Temperature resolution	0.01	$^{\circ}\text{C}$	
Temperature accuracy	0.3	$^{\circ}\text{C}$	(4)
Pressure resolution	0.01	kPa	
Pressure accuracy	0.5	kPa	
Rel. Humidity resolution	0.04	%	
Rel. Humidity accuracy	+/- 2	%	Between 20% and 80%

- (1) As pointed at the beginning of this data sheet, resolution and accuracy values for PM measures are given referring to the optical signal produced by the particulate sample. Analogous values for the mass units of PM are derived after a gauge process that is affected by the type and distribution of particles (carbon powders, typical of winter PM due to heating systems, determine a much higher conversion coefficient than biological or silicon based powders more relevant in summer PM). Accuracy of the mass value of PM should be referred to a specific site and a specific time, and it should be assessed by means of a reference measurement (lasting a few hours at least) performed with a weighting method (Primary measurement method).
- (2) The longer the measurement time the higher its accuracy. An accuracy higher than one part over  $10^3$  is obtained for measurements lasting 10 seconds or more.
- (3) The factory set standard range corresponds to a maximum concentration equal to about  $1500 \mu\text{g}/\text{m}^3$ . That produces, considering the accuracy indicated in (2) a measurement sensitivity better than  $2 \mu\text{g}/\text{m}^3$  for measurements on intervals of 10 seconds or more.
- (4) Temperature is sensed at the air fan inlet. It is thus indicative of the air inserted inside the optical cell. It is certainly some degrees different from the "external ambient temperature" as it is affected by the heat produced by the instrument itself.

## Versions (Dimensions, weight, use ).

Version	Control unit	Internal Battery	Dimensions	total weight	USE	Availability
PC-R	External PC	NO	318x257x152	3.4 kg	INDOOR/ (outdoor PC depending)	<b>4/6 weeks</b>
T-R	Tablet on board	NO	318x257x152	3.4 kg	INDOOR/ OUTDOOR	<b>4/6 weeks</b>
PC-B	External PC	24V- 5Ah	318x257x152	5.8 kg	INDOOR/ (outdoor PC depending)	<b>From June 2016 (TBC)</b>
T-B	Tablet on board	24V-5Ah	318x257x152	5.8 kg	INDOOR/ OUTDOOR	<b>From June 2016 (TBC)</b>

### Standard Purchase Conditions:

- **1 year warranty.**
- **PC-R e T-R versions are compatible with all the external battery packs indicated herebelow.**  
(please read the LCT-14 quick reference guide at the URL [www.qbit-optronics.com](http://www.qbit-optronics.com))
- **Versions PC-B e T-B have an internal LiFePO4 5Ah battery pack.**
- **Software (with upgrades) included.**
- **1 Year data Hosting on the [www.qbit-optronics.com](http://www.qbit-optronics.com) site.**
- **Successive hosting available on request (TBA)**
- **Warranty extension available on request (TBA)**

### External batteries (size, weight, operation/charging time)

battery	Voltage	Capacity	Operation /charging	Box type	Box dimensions	Total weight	USE
UPS	220 Vac	12V -7Ah (84 Wh)	4-5 h / 3h	UPS (plastic)	90x160x285	5.5 kg	INDOOR
Lead 10 Ah	24 V	24V/10Ah	24h / 24h	Metallic	100x150x200	8-9 kg	OUTDOOR
LiFePO 5Ah	24 V	24V- 5Ah (120 Wh)	>15 h / 2.5h	Anodized aluminum (1)	55x146x222	1.5 kg	OUTDOOR
LiFePO 8 Ah	24 V	24V-8Ah (192 Wh)	~24 h / 4h	Anodized aluminum (1)	105x121x171	2.0 kg	OUTDOOR

(1) IP66.