

# On-Line Particle Counting With Laser Accuracy



*Model C10/77*

Laser Particle Counter

# Data You Can Count On

Turbidity monitoring of filtered potable water provides an excellent indicator of water clarity as well as a reliable measure of general filter efficiency. Recent studies, however, indicate that particle count data can provide additional information concerning filter operation, and often can provide an early warning of filter breakthrough before turbidity values begin to rise. In addition, particle count data can indicate breakthrough of particles in the *Cryptosporidium* (3-5 micron) or *Giardia* (7-10 micron) size ranges before any change in turbidity can be detected.

On line particle measurement can be an extremely valuable operating tool for any water plant striving to meet increasingly stringent surface water treatment regulations. The response of treatment processes to changes in chemical addition can be measured with high sensitivity,

helping to optimize suspended solids removal. Filter backwash operations can be monitored to ensure that particle counts have declined to low levels before the filter effluent is again allowed into the distribution system. Log removals can be easily monitored on individual filters and recorded to document system operation. These and other benefits of particle monitoring can be easily incorporated into any water treatment monitoring system.



A unique feature of the C10/77 sensor is an easily removable measuring cell. Since deposits on optical surfaces can degrade particle sensors over time, the cell can be easily removed for cleaning. And because all cells are interchangeable, a spare cell can be inserted in seconds so that monitoring can continue while cell cleaning is done at your convenience.

## Particle Measurement

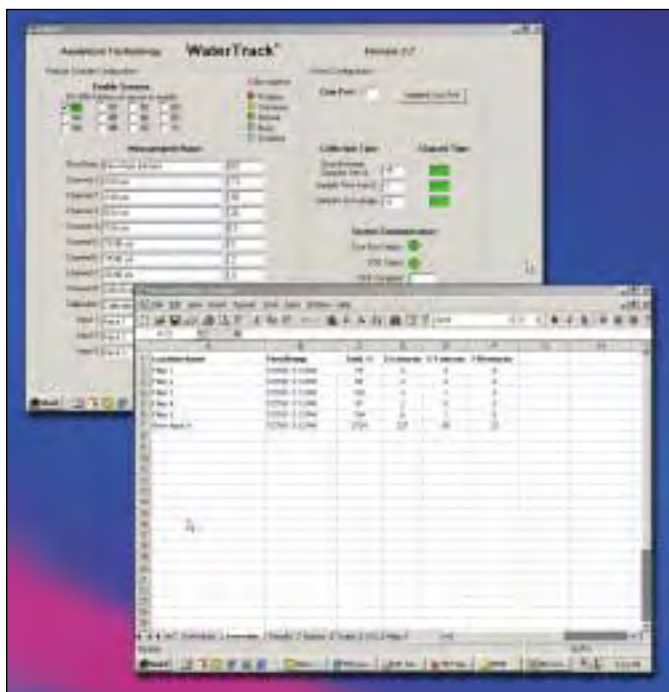
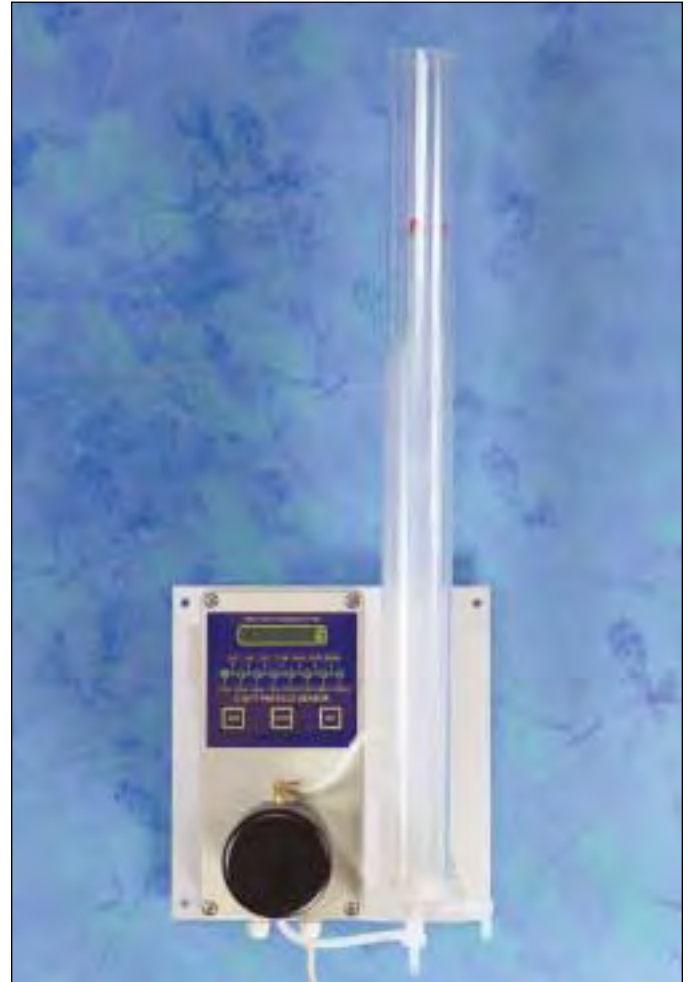
ATI's Model C10/77 Particle Sensor is designed to provide valuable particle data by continuously monitoring particle counts in raw water, filter influent, or filter effluent. Based on a laser light blocking principle, this sensor will provide particle count data over size ranges from 2 to 400 microns, with three 4-20 mA analog outputs and an RS-232/485 digital output supplied as standard. The scaling of the three 4-20 mA outputs is selectable by use of DIP switches mounted on the counter circuit board, and can be set from 0-127 up to 0-32,000 counts per ml., with one channel proportional to total particles, one channel proportional to particles in the range of 3-5 microns, and one channel proportional to particles in the range of 7-10 microns. The digital output provides actual particle counts for particle

sizes 2, 3, 5, 7, 10, 15, 20, and 200 microns. This data can be used for computerized calculations of filter removal efficiencies as well as trending of particle data.

Each C10/77 Particle Sensor contains an integral LED display used to indicate either raw count data or differential counts. The user may select a display of the total particles above a certain size, or differential counts of 2-3 $\mu$ m, 3-5 $\mu$ m, 5-7 $\mu$ m, 7-10 $\mu$ m, 10-15 $\mu$ m, or 20-200 $\mu$ m. The display is operated from sealed membrane switches on the front of the unit. Particle alarm indication can also be programmed at the counter so that high particle counts are indicated locally.

Data from other devices can also be monitored through the C10/77 Counter. Each unit contains 3 optically isolated 4-20 mA input channels. This allows data from other instruments such as turbidimeters, pH monitors, residual chlorine monitors, etc. to be read over the RS232/485 communication link using the WaterTrak software package.

Particle sensors require relatively little in the way of operator maintenance or adjustment. Sensors are factory calibrated and do not require field adjustment. The only requirement is that sample flow be maintained at 60 cc/min. This can be done conveniently using a constant-head flow control supplied as part of the sensor assembly. The flow controller also serves as a degassing chamber to remove entrained air, which can cause inaccurate particle measurements.



### Particle Counter Software

Software for PC based particle count data acquisition and display is available with C10/77 counters. The software consists of the LHLINK communication driver and WaterTrack display software. The LHLINK driver communicates with up to 12 counters and transfers information by DDE (dynamic data exchange) directly into Excel. The WaterTrack software is an Excel application that provides particle count display in tabular and graphic form, and storage of accumulated data in daily files. Direct user customization can be done by any user familiar with the Excel spreadsheet program.

## Model C10/77 Laser Particle Counter

Particle Sizes:	2.0, 3.0, 5.0, 7.0, 10.0, 15.0, 20.0, 200.0 $\mu\text{m}$	Calibration Method:	USP788 in Water and Standard Count matching
Differential Sizes:	2-3, 3-5, 5-7, 7-10, 10-15, 15-20, 20-200 $\mu\text{m}$	Light Source:	780 nm laser diode
Display:	Integral LED, 99,999 counts per ml. with channel selector switch	Expected Laser Life:	40,000 hours
Output Channels:	Three 4-20 mA outputs may be either total or differential counts selectable by the user. Output scaling from 0-127 up to 0-32,000 particles per cc.	Cell Size:	800 x 800 micron
Particle Alarms:	Alarm setpoint programmable for each particle size. Alarm indicated on local display.	Sample Flowrate:	60 ml./min.
Communication:	RS232 half-duplex or RS-485 (Jumper selectable)	Power:	12-30 VDC, 400 mA maximum
Maximum Particles:	32,000/ml.	Wetted Materials:	BK7 Glass, anodized aluminum or Stainless Steel
Sensitivity:	2 micron with 50% count efficiency	Sample Pressure:	0-100 PSIG
Resolution:	10% or better, USP 788 method at 9.87 micron.	Aux. Inputs:	Three 4-20 mA inputs from external devices, optically isolated
Optical Coincidence Loss:	5% Coincidence @ 18,000 counts per milliliter.	Enclosure:	NEMA 4X, Epoxy Painted Cast Aluminum
Calibration Particles:	NIST Traceable Polystyrene Latex Spheres	Size:	4.7"W x 9.4"H x 7.4"D (119 x 239 x 187 mm)
		Weight:	6.5 Lbs. (3 Kg.).
		WaterTrack Software (RS232):	Used for single sensor data monitoring
		WaterTrack Software (RS485):	Used for up to 18 sensor data monitoring

## Ordering Information: Model C10/77

63-0004 Complete Particle Sensor with display  
 00-0946 Constant-head flow controller with mounting plate  
 63-0024 Spare particle sensor flowcell  
 58-0001 WaterTrak software, RS-232 Version  
 58-0002 WaterTrak software, RS-485 Version



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