apparatus. Upon receipt of such command, the microprocessor of the apparatus retrieves the requested data from its RAM and sends it for storage in the memory of the data transfer unit, via the connector **16**.

When it is desired to retrieve the data thus stored in the data transfer unit, the unit is in turn connected, via a standard computer or printer jack for example, to an external output device (FIG. **12**) in the form of a conventional printer or computer (e.g., a personal computer). The stored data can be read out directly on a printer to produce a hard copy thereof, with the microprocessor of the data transfer unit itself operating the printer in a known manner. The user is thus able to obtain a complete and accurate hard copy record of the data. Alternatively, the stored data can be transferred from the unit to a conventional computer for manipulation using an available software program for statistical analyses, spreadsheeting, etc.; for more permanent storage in a database stored in the computer's memory; and/or for printing by a printer connected to the computer.

Although it may not often be practical, the external connector **16** described above can alternatively be directly linked to a remote computer for direct transfer of the stored data if and when the apparatus itself is transported into close proximity with a computer. Alternatively, the external connector **16** can be directly linked, on-site, to a lap-top or notebook-type portable computer, and with the use of known communication software, stored data from the microprocessor can be transferred to the portable computer.

In accordance with another embodiment of the invention, the data transfer device may comprise a conventional modem, provided internally in the apparatus, or externally, so that stored data from the microprocessor can be transferred via a telecommunication network, such as a cellular telephone network, to a remote external output device. In this embodiment, the real-time, in situ monitoring capability of the fiber optic sensor, in combination with the substantially instantaneous transmission of data, enables a municipal engineer or other user to monitor analyte concentrations and loadings in a fluid discharge on substantially a real-time basis at a remote off-site location. This embodiment further permits central remote collection of data from a number of apparatus at various locations, via the telecommunication network, and long-distance re-programming of the program storage memory of each apparatus, as necessary.

The apparatus according to the invention may be adapted to monitor a number of different analytes, and to trigger sampler program operation on the basis of any desired one(s) of such analytes, depending upon the type of fiber optic sensor employed. The fiber optic sensor interface electronics and programming may be modified as necessary, depending upon the particular fiber optic sensor to be used. To this end, the program storage memory in the form of pre-installed EPROM chips may be programmed to perform the calculations necessary for a variety of different analytes. As such, the program storage memory can be programmed to have a relatively universal capacity capable of processing inputs from a variety of different sensors. Accordingly, the sensor **20** as described above can comprise a plurality of different fiber optic sensors responsive to different analytes of interest, so that in effect the sensor **20** serves as an in situ mini-lab capable of monitoring a number of different target pollutants or other analytes of interest, such as pH, biochemical oxygen demand, and the like.

The unique capability of the invention to provide actual loading data, i.e., of measuring the actual quantity of an analyte discharged into a receiving body or of averaging the values of a given analyte over time, is not restricted to use of a fiber optic sensor. For measuring the discharged quantity of an analyte, any type of sensor capable of providing in situ real-time measurement of an analyte may be employed as the sensor **20**, such as, for example, a sensor for detecting total petroleum hydrocarbon. Suitable interface means and signal programming, comparable to that described above for the fiber optic sensor, may be provided to accommodate any such sensor, so that measured values of the analyte may be multiplied by then-existing flow rates as measured by the flow measuring programming to calculate the actual volume of the analyte discharged over a given period of time. Various types of sensors other than fiber optic sensors are also suitable for averaging purposes, such as a pH electrode station described in the aforementioned U.S. Pat. No. 5,172,332, the disclosure of which is incorporated herein by reference thereto.

In use, the apparatus according to the invention can be conveniently transported for use in any desired application. When used in a sewer manhole, the apparatus can be conveniently mounted as a single unitary structure above an open flowing sewer passage. The apparatus is mounted for use by: connecting the sensor **20** and the flow sensor with respective ones of the connectors **16**; connecting the fluid intake conduit **9** with the pump **8**; appropriately mounting the sensors relative to the fluid in the channel; positioning the weighted strainer **12** at the end of conduit **9** within the fluid in the channel; and suspending the unit from the upper end of the manhole. The integral unit includes all the electronics, computer programming, and hardware required for fully automatic sampling, real-time analyte monitoring, calculating loading data, and storage of sampling and analyte data for later retrieval.

It will be further understood that the apparatus of the invention may be selectively employed for use for sampling and analyte monitoring both, for sampling only, or for monitoring one or more analytes only, as desired. The independent implementation of either the sampling assembly or the analyte monitoring modes can be effected via user input to the computer control means according to the invention.

By virtue of the in situ, real-time monitoring capability of the fiber optic sensor, in certain applications it may be desirable to eliminate sampling operations entirely. It will be understood that the apparatus can be modified to eliminate the automatic sampling assembly and related programming, if desired. Such a modified apparatus would retain the full capabilities of monitoring and recording flow rate and analyte concentrations, averages and loadings, and data transfer capabilities.

While there have been described hereinabove what are at present considered to be the preferred embodiments of the invention, it will be understood that modifications may be made therein without departing from the spirit and scope of the invention. The present embodiments are therefore to be considered as illustrative, and not restrictive. The scope of the invention is indicated by the appended claims rather than by the foregoing description.

We claim: