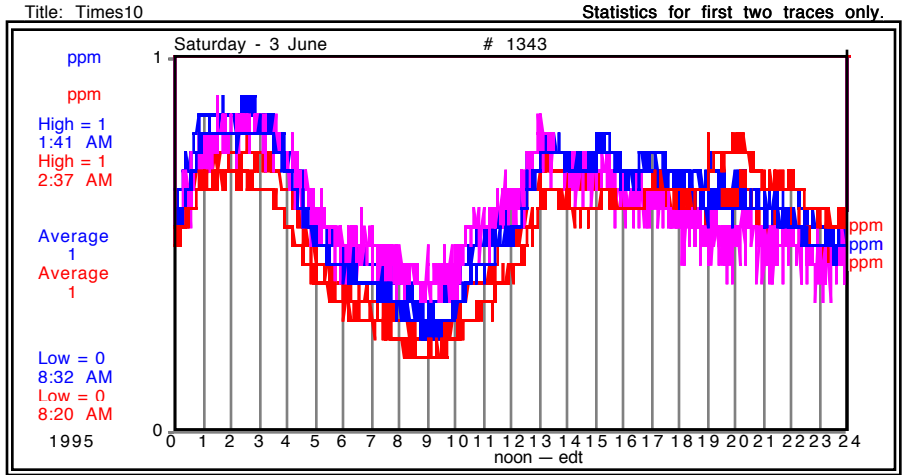


Two CO instruments monitoring over eight hours. The higher samples are in commute traffic in the San Francisco Bay Area.

Five CO instruments inside in San Francisco. The full scale is only one ppm. Located side by side, these data are ± 0.1 ppm CO between instruments

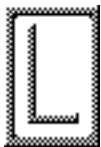


These carbon monoxide data were sampled with a resolution of 50 parts per billion.

CO @ 50 ppb

Bear Facts — #57

The Langan CO Personal Exposure Measurer is an important tool in the study of indoor air and outside. Now these measurements can be made in the parts per billion range.

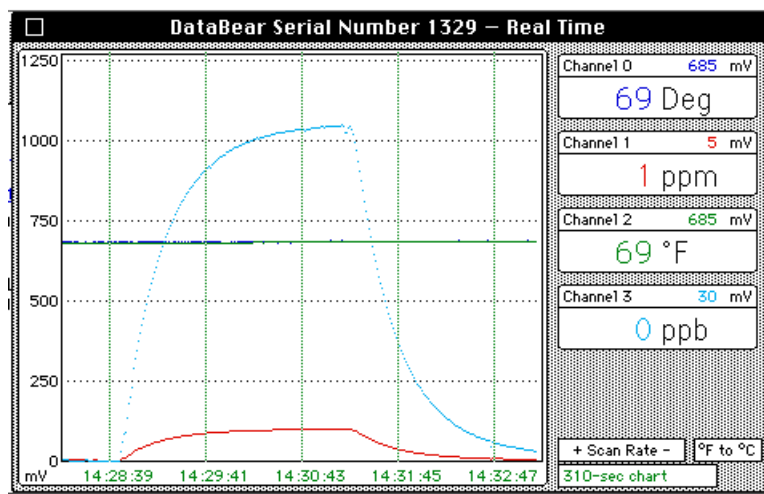


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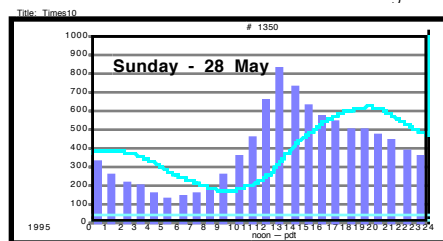
the DataBear

Bear Facts are published to provide useful insights into the operation and applications for the DataBear™ Measurer and associated complete instruments.



A 10 ppm calibration gas is shown in these data taken while the instrument is connected to a Macintosh; the expanded resolution shows the gas level within 30 ppb.

Hourly averages of CO plotted as ppb with 8-hour running mean



Extensive measuring with the Langan L15 CO Personal Exposure Measurer has shown that smaller changes in and lower levels of CO can be observed. Experimentation has shown that the response of the CiTicel® Electrochemical Sensor is measurable at a full order of magnitude more sensitive than originally believed. This means that very small changes in CO can be monitored in areas where the signal would otherwise be useless.

This is important for studies where the fall-off of CO presence can be observed, where sources of CO can be used to calculate the air exchange in a room of any size, where the nominal absence of CO is to be observed or where low levels indicate normal appliance operation.

In order to provide this added capability, an auxiliary signal amplification module is provided. It allows the measured interval to be changed from 0.5 ppm to 0.05 ppm (50 ppb). The specified range is then reduced to be 0 to 12.75 ppm. This separate signal is then attached to another channel on the data acquisition system so two ranges of CO are monitored.

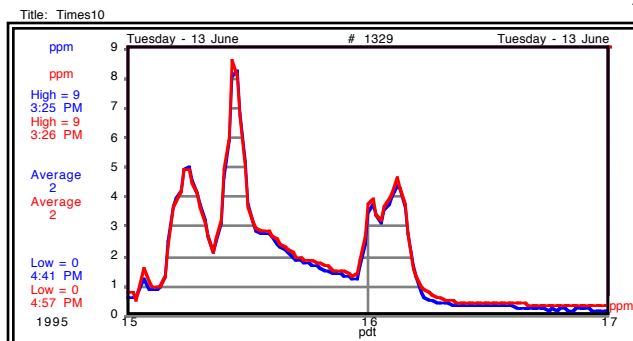
While the modest temperature response and zero offset inherent in these fuel-cell sensors remains, if temperature conditions are relatively stable, the low levels of CO are observed and repeatable with several instruments at the same location. By taking time series of data, zero levels can be defined as background, and the amplitude of the

presence of CO measured. Software calibration allows any backgrounds to be removed for data presentations.

The Langan Enhanced CO Module (Part 2600) consists of a printed circuit card and the hardware to mount it on the side of the Model L15, connection wires, a protective cover and a long-life battery support for the CO circuit. The included hex-wrench allows the module to be added by the user in a few moments.

For those who wish to adjust the multiplier circuit, different ranges can be attained. The accompanying manual describes all adjustments. This is left to those who feel confident in so doing.

Two CO instruments monitoring over two hours. The trace most close to the horizontal-scale lines resulted from two-second samples averaged to each minute. The second trace are samples taken each minute. Data were gathered in an auto, in a briefcase, on a freeway



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cut inside dotted line for small size

When just a small amount of CO is present it can be important to measure. Because this gas is stable and can be a surrogate for others, more costly to measure, increased resolution enhances the utility of this easy-to-use instrument. The capability can be added to all previously delivered instruments!