



SmartTether™

The Anasphere SmartTether represents a revolutionary approach to gathering atmospheric profiles within the lower troposphere using tethered blimps, balloons, or kites. It is orders of magnitude faster and less expensive as compared to traditional tethersonde systems and allows users to collect data simultaneously at multiple points along a tether. SmartTether applications include boundary layer wind profiling, fire weather, pollution monitoring, emergency response and flux measurements.

Data Modules:

The heart of SmartTether is a series of wireless data modules which are attached to the tether. The data rate has been tested at 1 Hz for 6 modules. The data modules send data to a PC-based receiver on the ground. The PC can send commands to an individual data module or an entire network.

Measurements:

SmartTether modules measure pressure, temperature, relative humidity, wind speed and wind direction. The modules have extra analog and digital inputs to which other sensors can be interfaced.

Real Time Wind Profiles:

SmartTether was originally designed to meet the needs of researchers studying highly variable boundary layer winds. These winds can be extremely variable as illustrated in the adjacent photograph. In the example, the blimp is at an altitude of 500 feet above the ground with the streamers located every 50 feet along the tether. The streamers clearly show just how variable the boundary layer winds can be, even over very small vertical distances.

Flux Measurements:

Flux measurements are another crucial area which SmartTether can be applied. One approach to gathering flux measurements is to make several vertically separated measurements of the species of interest (such as carbon dioxide) from the ground to the top of the boundary layer and then use mathematical models to calculate the flux. A paper by Kuck *et al.* (Journal of Geophysical Research, vol. 105, no. D17, pp. 22, 137-22, 146, 2000) describes this method in more detail.



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Additional Specifications:

Receiver:

The SmartTether requires our receiver. It interfaces directly to a standard PC and requires a 9 pin RS-232 Cable and a 12 VDC power source.

Number of Modules:

There is no practical limit to the number of modules in a SmartTether system. Systems using tens or hundreds are possible, depending on your lifting platform and data rate.

Data Rate:

The SmartTether system has a fundamental maximum data rate of 1 Hz. Ultimately, the number of modules and the number of data bytes collected per cycle at each module determines the maximum sampling rate.

Range:

The maximum range using the 900-MHz frequency range (U.S., Canadian and Australian customers) is approximately 3000 meters. The maximum range using the 2.4-GHz frequency range (for other international customers) is approximately 750 meters.

Power Requirements:

Each SmartTether module is individually powered by lithium or alkaline cells. The receiver module is powered by a 8-36 VDC power supply; a cord that plugs into a car's cigarette lighter socket is provided.

Operating Conditions:

The entire system is presently specified down to -40° C. Wind limits are subject to the performance limitations of the associated platform supporting the tether.

Platforms:

The SmartTether system may be used with any type of tethered platform, including balloons, blimps and kites.

Anasphere can provide suitable platforms and winches. We also assist users in finding appropriate platforms to match with SmartTether. Please call us for pricing information.



About Anasphere:

Anasphere was founded in 2002 to pursue the development of miniature instruments for atmospheric research. Trace gas sensors and meteorological sensor systems are major areas of company activity. Many of Anasphere's sensors are designed for use on sounding balloons and small UAVs.

Anasphere's customers include the federal government, the private sector and educational institutions. Revenues come from a combination of R & D and instrument sales.