

BLS900

Large Aperture Scintillometer – Dual-Disk Design



Photo courtesy of CSIR, South Africa

The Scintec BLS900 Large Aperture Scintillometer measures atmospheric turbulence, heat flux and crosswind over path lengths between 250 m and 6000 m. As part of a meteorological station it can also be used to determine the evapotranspiration over extended areas.

A scintillometer senses turbulence between an optical transmitter and a receiver. The operation principle is based on the modulation of light by atmospheric refractive index fluctuations in the air. The phenomenon is called scintillation and is the reason why stars twinkle at night.

Compared to conventional turbulence measurements with point sensors, scintillometers gather spatially representative results with lower statistical scatter and shorter averaging times.

The Dual-Disk Design of the BLS900 provides for instantaneous corrections of absorption fluctuations, saturation of scintillation and outer scale effects. This results in significantly higher data quality and increased measurement ranges. All BLS Series scintillometers use LED arrays. Wide emission angles virtually eliminate the need for transmitter alignment and maintain high data accuracy even when used on towers which are prone to vibration.

FEATURES

- measures turbulence over large spatial scales
- Dual-Disk Design for unrivalled accuracy
- crosswind measurement capability
- maximum path length 6000 m
- LED array eases transmitter alignment
- LED array allows transmitter to be mounted on vibrating towers
- built-in Receiver Alignment Monitor
- included Signal Processing Unit performs all calculations
- 6 GB built-in data storage
- various remote access options

APPLICATIONS

- surface energy balance
- satellite data ground truth
- plant evapotranspiration
- agrometeorology, forestry
- hydrology, water management
- turbulence studies
- atmospheric dispersion
- optical propagation conditions
- military
- runway crosswind

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Data output

Data output includes (but is not limited to):

- structure parameter of refractive index fluctuations (C_n^2)
- structure parameter of temperature fluctuations (C_T^2)
- sensible heat flux
- crosswind (horizontal wind component perpendicular to the optical propagation path)
- mean, standard deviation, minimum and maximum of intensity (for each disk)
- scintillation index (at user-defined wavelength and path length)
- Fried diameter (at user-defined wavelength and path length)
- correlation coefficient of intensity
- raw intensity data (for each disk)
- data quality code

| Description | Specifications | Remarks |
|--|------------------------------|--|
| No. of transmitting disks | 2 | horizontally spaced |
| No. of LEDs | 888 / 36 | infrared / visible |
| Optical output power | 12 W peak | at 880 nm wavelength |
| Transmitter divergence | 16° | full width at half maximum |
| Receiver field of view | 8.4 mrad | receiver alignment automatically monitored |
| Corrections for absorption fluctuations and outer scale effect | yes | automatic |
| Crosswind measurement capability | yes | in continuous mode only |
| Path length | 250 / 500 to 6000 m | with / without Path Reduction Aperture |
| Pulse repetition rates (PRR) | 1, 5, 25 Hz or continuous | |
| Integration time | 1 sec to 60 min | |
| Output ports | Ethernet, RS-232, analogue | ASCII |
| Data Storage Capacity | 6 GB | |
| Internal clock | date and time | |
| Operating voltage | 12 to 24 VDC | AC power supply available |
| Power consumption: Transmitter | 60 W / 13 W / 3.5 W / 1.5 W | in continuous mode / at 25 Hz PRR / at 5 Hz PRR / at 1 Hz PRR |
| Power consumption: Receiver and SPU | 15 W | |
| Operating temperature | -35 to +50°C (-30 to +120°F) | |
| Dimensions and weight: Transmitter | 36 x 18 x 14 cm / 8.5 kg | |
| Dimensions and weight: Receiver | 61 x 32 x 16 cm / 7.6 kg | |
| Dimensions and weight: SPU | 37 x 23 x 17 cm / 7.0 kg | |

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Specifications are subject to change without notice.
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