Scintec is ISO 9001 quality certified

LARGE APERTURE SCINTILLOMETERS

BLS450 Neo

BLS900 Neo

BLS2000 Neo

BLS Neo Series

Features

- Measures turbulence over large spatial scales
- Maximum path length up to 12 km
- Dual-Disk Design for unrivalled accuracy for BLS900 Neo and BLS2000 Neo
- Crosswind measurement capability for BLS900 Neo and BLS2000 Neo
- Built-in Receiver Alignment Monitor
- LED array eases transmitter alignment
- LED array allows transmitter to be mounted on vibrating towers
- Signal Processing Unit performs all calculations
- 6 GB built-in data storage
- Remote access
- Infrared window heating available

Applications

- Surface energy balance
- Satellite data ground truth
- Plant evapotranspiration
- Agrometeorology, forestry
- Hydrology, water management
- Turbulence studies
- Atmospheric dispersion
- Optical propagation conditions
- Defense weather
- Runway crosswind

SCINTEC

BLS Neo Series

LARGE APERTURE SCINTILLOMETERS

The Scintec **BLS Neo Series** Scintillometers measure atmospheric turbulence, heat flux and crosswind over large spatial scales. With complementing meteorological sensors, the BLS Neo Series Scintillometers can also be used to determine the evaporation or evapotranspiration over extended areas.

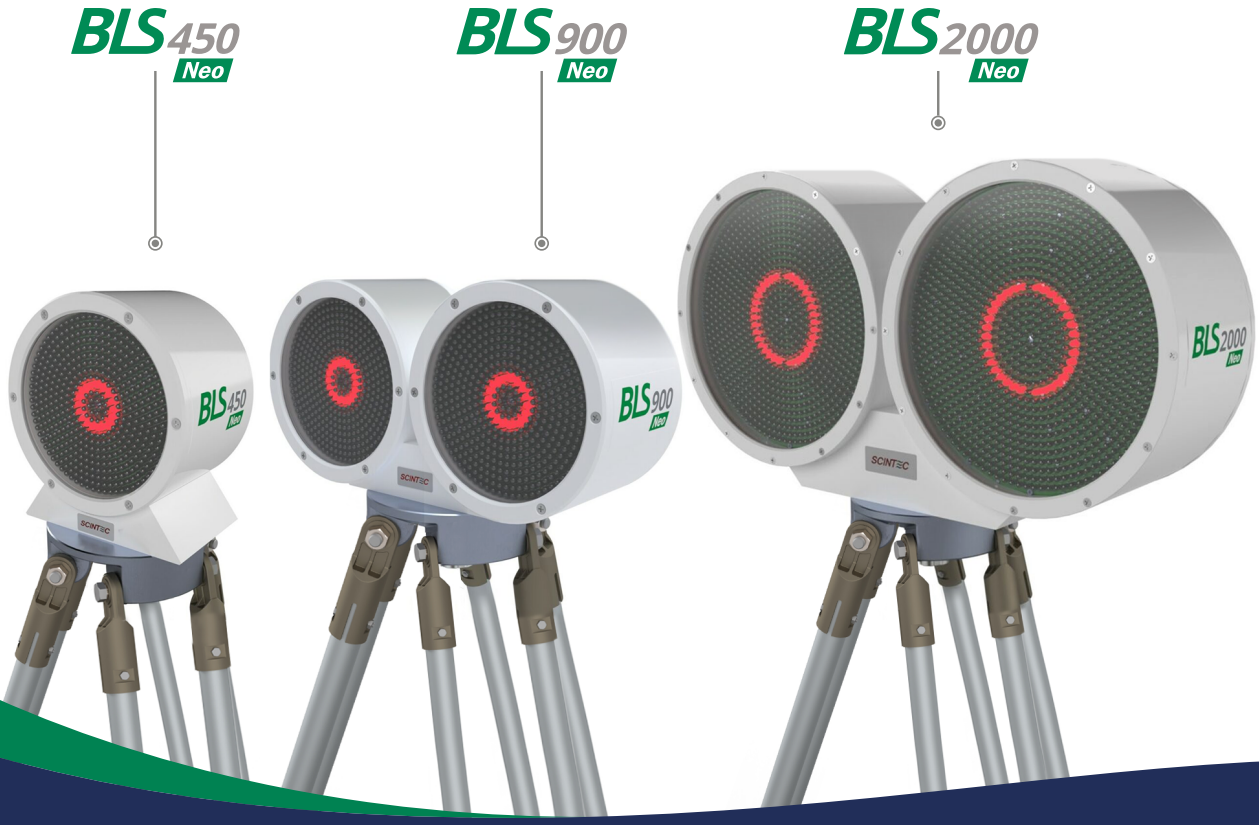
A scintillometer senses turbulence between an optical transmitter and a receiver. The operation principle is based on the modulation of light by atmospheric refractive index fluctuations in the air. The phenomenon is called scintillation and is the reason why stars twinkle at night.

The models of the Scintec BLS Neo Series are so-called large aperture scintillometers. Large transmission and reception areas allow for measurement ranges of several kilometers without saturation of scintillation.

This compares to laser scintillometers where the transmitter-to-receiver distance is limited to a few hundred meters due to saturation.

Compared to conventional turbulence point sensors, scintillometers gather spatially representative results with lower statistical scatter and shorter averaging times. All BLS Neo Series Scintillometers use LED arrays as transmitters. Wide emission angles virtually eliminate the need for transmitter alignment and maintain high data accuracy even on drifting mounts or on towers which are prone to vibration.

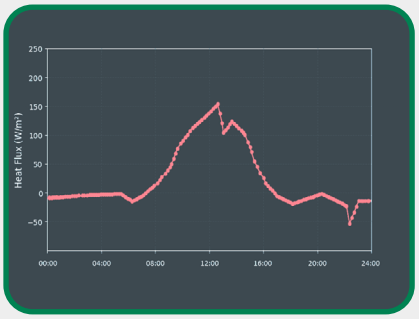
The Neo Version (New Emission Option) operates at a wavelength of 850 nm and features a significantly reduced power consumption and increased LED lifetime.



WHY SCINTILLATION IS SUPERIOR?

Spatially Representative Data

Scintillometers measure a path average between a transmitter and a receiver. This leads to representative data even in inhomogeneous terrain. The large footprint of a scintillometer contrasts with the small footprint of a conventional point sensor, which is solely determined by the fetch and largely dependent on wind direction and atmospheric stability.

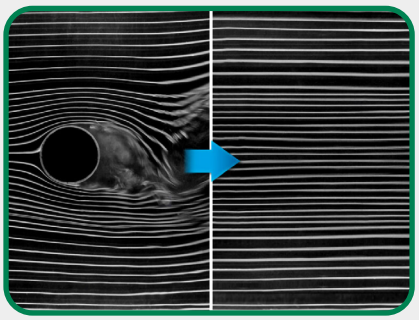


High Temporal Resolution

The path averaging of a scintillometer reduces the need for temporal averaging compared to a conventional point sensor. This means that a scintillometer can produce statistically stable averages in much shorter times. As an estimate, one scintillometer can replace about 100 conventional point sensors for a similar statistical significance with identical averaging times.

Double-Ended Remote Sensing

Scintillometers can easily measure over water, across a valley or over urban areas, for example, where the deployment of in-situ sensors would be troublesome.



No Flow Distortion

The path weighting function of a scintillometer reaches zero at the transmitter and receiver positions. So there is virtually no distortion of the turbulent flow caused by the instruments themselves. This compares to point sensors, where a flow distortion correction is needed and often essential.

MODELS

Large Aperture Scintillometer BLS450 Neo

The Scintec BLS450 Neo measures atmospheric turbulence and heat flux over path lengths between 500 m (100 m with Path Reduction Aperture) and 6000 m. It uses one radiating disk, which makes it the most economical and lightest of the BLS Neo series.

Large Aperture Scintillometer BLS900 Neo Dual-Disk Design

The Scintec BLS900 Neo measures atmospheric turbulence, heat flux and crosswind over path lengths between 500 m (100 m with Path Reduction Aperture) and 6000 m. The Dual-Disk Design of the BLS900 Neo 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.

Large Aperture Scintillometer BLS2000 Neo Dual-Disk Design

The Scintec BLS2000 Neo measures atmospheric turbulence, heat flux and crosswind over path lengths between 1 km (500 m with Path Reduction Aperture) and 12 km. As with the BLS900 Neo, the Dual-Disk Design of the BLS2000 Neo provides for instantaneous corrections of absorption fluctuations, saturation of scintillation and outer scale effects resulting in significantly higher data quality and increased measurement ranges.

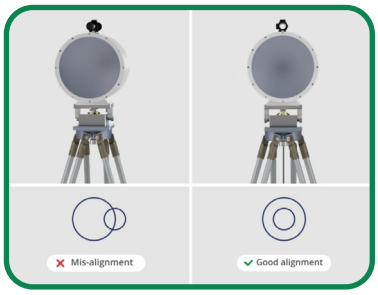
COMPETITIVE ADVANTAGES

Wide Emission-Angle

All BLS Neo Series transmitters use multiple LEDs with wide emission angles. This drastically simplifies the alignment compared to telescope-based transmitters. It also allows operation of the transmitter from vibrating platforms such as towers or tripods in strong wind. Power consumption is still low with the optional pulsed modes.

Dual-Disk Design

The BLS900 Neo and BLS2000 Neo use dual transmitting disks. In this way, they can eliminate intensity fluctuations caused by absorption changes instead of temperature fluctuations. This is especially important in conditions of weak thermal turbulence. In strong thermal turbulence, the dual-disk design allows the instrument to operate deeper into saturation since a saturation correction is applied. The dual-disk design gives accuracy advantages in both weak and strong turbulence conditions.



Position-Sensitive Detector for Receiver Alignment

All receivers of the Scintec BLS Neo Series contain a position-sensitive detector indicating incorrect receiver alignment and hence avoiding measurement errors.

Crosswind Measurement Capacity

The Scintec BLS900 Neo and BLS2000 Neo can measure crosswind. This includes the sign (direction) of the crosswind. These instruments can also reliably measure crosswind if the wind direction is near the direction of the optical propagation paths.

Separate Storage Unit for Easy Data Access

All Scintec BLS Neo Scintillometers store their measurement data in a designated Signal Processing Unit (SPU). The SPU is separate from the receiver and can be mounted in a location convenient for access to the data. Since the receiver must be mounted pointing at the transmitter, usually on a tripod or another elevated platform, it may not be in easy reach.

OPTIONS

Infrared Window Heating for BLS450 Neo and BLS900 Neo

The receiver is optionally equipped with a highly efficient infrared window heating to minimize obstruction of the lens by snow and ice. In wet climates, it can also help to prevent condensation.

Window Heating for BLS2000 Neo

On request, the BLS2000 Neo Receiver is available with an additional heating system for the collimating Fresnel lens. The DC power for the lens heating is supplied via the cable connecting the SPU and the BLS2000 Neo Receiver.

ACCESSORIES

AC Power Supply

This unit is for operation of BLS Neo Series systems with AC power.

Path Reduction Aperture

To reduce path length down to 100 m (BLS450/900 Neo) or 500 m (BLS2000 Neo).

Tripod, height 1.80 m and 3.00 m

The tripod provides sturdy support for the Transmitter and Receiver of BLS Neo Series.

Real-Time Basic Extension

The Real-Time Basic Extension contains temperature, humidity, and pressure sensors for the calculation of the structure parameter of temperature. A data logger allows for connecting other sensors provided by the user.

Real-Time Heat Flux Extension

The Real-Time Heat Flux Extension contains two temperature sensors, pressure sensors, wind speed and direction sensors, and a combined temperature and humidity sensor for an accurate calculation of C_T^2 and sensible heat flux for all - unstable and stable - conditions. A data logger allows for connecting other sensors provided by the user.

Real-Time Evapotranspiration Extension

The Real-Time Evapotranspiration Extension contains net radiation sensors, two soil heat flux sensors, precipitation sensors, two temperature sensors, pressure sensors, and a combined temperature and humidity sensor for determining the evapotranspiration in terms of latent heat flux through the so-called energy-balance method. A data logger allows for connecting other sensors provided by the user.

Direct Meteorological Data Input DMI-1

The DMI-1 option consists of a temperature sensor, a barometric pressure sensor, a small tower, and cables to connect the sensors directly to the SPU.

Mounting Screw

The Mounting Screw secures the Transmitter and Receiver of the BLS Neo Series to a stable platform.

Real-Time Upgrade Aspirated Radiation Shield

This set of two Aspirated Radiation Shields can be used with the Real-Time Heat Flux and Evapotranspiration Extensions for higher accuracy in temperature measurements.

Real-Time Sensor Interface Software

The Real-Time Sensor Interface Software allows data from sensors from Real-Time Extensions or other weather stations connected to the Signal Processing Unit to be integrated into the SRun software.

Weather Station Port Cable, 30 m

This optional cable can be plugged into the Weather Station Port of the Signal Processing Unit. It can be used to have the BLS measurement data transmitted in real-time to your equipment.

Analog Raw Signal Output Cable, 3 m

The analog output cable with open wires is optionally available to connect the Analog Out Port of the Signal Processing Unit to an external datalogger or other signal processing equipment.

Learn more about the complete list of extensions and accessories on **www.scintec.com**

SPECIFICATIONS

Description	*BLS450 Neo*	*BLS900 Neo*	*BLS2000 Neo*	Remarks
No. of transmitting disks	1	2	2	horizontally spaced
No. of LEDs	450 / 18	900 / 36	1768 / 68	infrared / visible
Transmitter divergence	20°			full width at half maximum
Receiver field of view	8 mrad	8 mrad	7.5 mrad	receiver alignment automatically monitored
Corrections for absorption fluctuations and outer scale effect	no	yes	yes	automatic
Crosswind measurement capability	no	yes	yes	in continuous mode only
Path length	100 / 500 to 6000 m	100 / 500 to 6000 m	500 / 1000 m to 12 km	with / without Path Reduction Aperture
Pulse repetition rates	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	10 to 15 VDC			AC power supply available
Power consumption: Transmitter “Long Path”, “Boost”	10 W / 3 W / 1.6 W / 1.3 W	20 W / 6 W / 3 W / 2.5 W	40 W / 12 W / 6 W / 4.7 W	continuous mode / 25 Hz / 5 Hz / 1 Hz pulse repetition rate
Power consumption: Receiver and SPU	16 W			
Operating temperature	-35°C to +50°C (-30°F to +120°F)			
Dimensions and weight: Transmitter	18 x 18 x 14 cm / 4.5 kg	36 x 18 x 14 cm / 8.5 kg	59 x 33 x 17 cm / 22 kg	
Dimensions and weight: Receiver	61 x 32 x 16 cm / 7.6 kg	61 x 32 x 16 cm / 7.6 kg	57 x 48 x 30 cm / 19 kg	
Dimensions and weight: SPU	33 x 23 x 18 cm / 8 kg			

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) for BLS900 Neo and BLS2000 Neo
- 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 for BLS900 Neo and BLS2000 Neo
- Raw intensity data (for each disk)
- Data quality code

Installations worldwide



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