BIS-06 global solar radiation/sunshine duration sensor

The **BIS-06** device is designed to measure the actual physical intensity and duration of the sunshine. The operation is based on the measurement of direct incoming power under a wide spectrum transmission glass dome. According to the requirements of the global warming, the device has extended measuring range and special compensation methods to take the nonlinearities and other errors (like angle errors, etc.) into count.

The sensor is the ideal choice to measure available energy in solar energy (PV) applications, plant growth, thermal convection and evapotranspiration.

The device has its own microcontroller to do the math stuff and to store the calibration data. The sensor continously calculates the **Clearness Index** for the different weather conditions (clear sky, partially clouded, etc.), and upon the Clearness Index the direct and diffuse radiation is calculated by the internal microcontroller. As a result of the calculations, the direct radiation value is compared to a limit value expressed in W/m2; if the value is greater than or equal to the limit, the sensor will increment an internal counter. The final value of this counter has the physical meaning of Sun Duration in seconds. The limit has a default value of 120W/m2 but it is free to change using the appropriate SensorSetup program.

With an adjustable shade the device can be used to measure the diffuse sunshine exclusively. Additionally, because the device has the standard RS-485 field bus as output, it is easy to connect two BIS-06 together: one measures the direct sunshine, while the other measures the diffuse power (albedometer).

The device has built-in microcontroller to control the measures and to send the results to the data logger or PLC.

The device has polyglot (multilingual) protocol to support Boreas' System-6 and the industry-standard MODBUS protocol simultaneously so the customer has the ability to use our latest development results with our BCU dataloggers or to implement industrial process control with MODBUS-compatible PLC. The serial interface has built-in over-voltage and lightning protection.

The BISL-06 device implements our LogSense technology which implements the functionality of sensor and data logger with built-in solid-state memory. The stored data (with time stamp) could read out over the serial connector with our S6-ReadStation or MeteoLux program or can be transmitted over radio link or GPRS connection to our SocketServer. The LogSense device can control our ComBuoy communication device.

The /PAR device measures the photosynthetically active radiation (umol/m2sec) in the 400 to 700 nanometer wavelength range.

The physical interface of the device is either RS-485 or RS-232 compliant. The RS-232 is recommended to use as LogSense device. The data and power lines are ptoected against overvoltage.

For particular demands the following sensors are available:

Sensor	Data Interface
BIS-06, BISL-06	Digital RS-485
BIS-06/232, BISL-06/232	Digital RS-232
BIS-06/AU, BISL-06/AU	Analog 0-10 V (different ranges are available as well)
BIS-06/AI, BISL-06/AI	Analog 4-20 mA (different ranges are available as well)

Technical Data

	Global Radiation	Sunshine Duration
Measuring Range	0-2000W/m2	0…PERIOD seconds
Resolution	1 W/m2	1 second
Accuracy	5% FSR	5 % FSR
Settling Time	7 sec.	7 sec.
Power	8-15 V / 1mA avg, 5 mA max.	
Data Interface	Digital RS-485 or RS-232	
Optional Data Interface	Analog 0-10 V, 4-20 mA	
Communication	System-6 and MODBUS RTU protocol	
Overvoltage Protection	+/- 6,7V 600W@1msec (data lines)	
	+/- 17,1V 600W@1msec (power line)	