

BRINO – Frost, Dew, Rain, Snow and Hail detector (Rev.1 011216)



Description

BRINO is a smart multiparametric detector able to distinguish with high sensitivity and response speed the following atmospheric events:

- hail
- rain/snow
- icing (frost, nights frosts, ice road, aerial lines, etc...)
- condensation (dew, fog)

Differently from the most common sensors in the market, BRINO is able to detect the atmospheric event with high accuracy because it's provided of a smart cpu that combines an acoustic transducer to the air temperature-humidity measure (for the calculation of the dew/frost point) and to a condensation sensor.

BRINO is made with stainless and atmospheric proof materials. Furthermore the sensor is provided of an internal heater (mounted in the top of the conic part), that is activated by a simple optional thermostation system, to facilitate the melting of snow and ice.

Rain events Detector Operation Principle

The BRINO sensor interface is controlled by a microprocessor that captures every second the information from the acoustic transducer and the temperature and humidity sensors of the air and wetting. An internal algorithm for this interface allows you to determine the type of rainfall and / or condensation present (dew or frost). This information is then transformed into an electrical signal on 4 distinct analog outputs that will remain active until the external conditions change. Outputs can then be connected to external scanners such as industrial PCs, PLCs or other Geoves Dataloggers such as the Butterfly that will be described in the next paragraph.

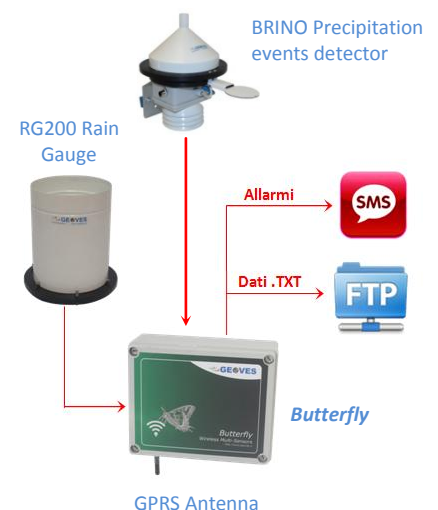
Butterfly and rain gauge data logger functionality

Butterfly is a device that allows to store and transmit data via GPRS from various measurement sensors including the BRINO detector. When exceeding pre-defined and programmable thresholds it is also possible to send and manage any alarms via SMS.

The measures taken by the Butterfly Dataloggers are:

- the present condensation event (dew or frost)
- identification of the precipitation type (rain, snow, hail)
- the duration of the event
- instantaneous intensity of precipitation (by integrating the RG200 or RG400 rain gauge)
- the total amount of water or snow falling (the latter with heated rainfall)

Each Butterfly measure can handle the alarm by alerting the available personnel in real time. Also thanks to the very low power consumption of the system with a small photovoltaic panel and wireless GPRS transmission, Butterfly can be easily installed on any site without the need for connections



Main applications

- ✓ Agriculture / Agrometeorology / Irrigation
- ✓ Routes, railways, runways monitoring
- ✓ Civil applications
- ✓ Telecommunications
- ✓ Industrial applications

Technical Data

Model	BRINO - Detector of Frost/Ice-Dew-Rain-Snow-Hail atmospheric events
Transducer	Cpu unit with acoustic transducer combined to a termohygrometer and a wetness leaf sensor
n.4 electrical outputs (0...5000mV)	Out n°1: 0Vdc=no event, 5Vdc=Hail Out n°2: 0Vdc=no event, 2.5Vdc=Rain, 5Vdc=Snow Out n°3: 0Vdc=no event, 5Vdc=Ice/Frost Out n°4: 0Vdc=no event, 5Vdc=Condensation/Wetting
Gnd of power supply (Gnd for outputs)	Gnd Signal=Gnd Supply
Power and consumption	12...24Vdc $\pm 10\%$ <15mA @ 24Vdc
Power supply for heating system	12...24Vdc 250mA Max @ 24Vdc
Optionnal thermostat activation (cod. Geoves TERMST)	On <5°C Off >5°C $\pm 0.3^\circ\text{C}$
Working Temperature	-40...+80°C
Housing	plastic, stainless steel, painted aluminium
Connector	8 pin M12 with solder contacts; IP68 protection
Standard cable	Cable L=4m (longer lenghts on request), multipolar type 2x1mm ² (heating) + 6x0.22 (signal)
Overall dim., weight	$\varnothing 300 \times h300\text{mm}$, 850g

Electrical Connection

Model	BRINO (cable included with the sensor)	
Connector M12 on the sensor	Pin1: White wire Pin2: Green wire Pin3: Yellow wire Pin4: Orange wire Pin5: Red wire Pin6: Gray wire Pin7: $\varnothing 1\text{mm}^2$ Red wire Pin8: $\varnothing 1\text{mm}^2$ Black wire	Out+ Hail signal Out+ Rain/Snow signal Out+ Ice signal Out+ Condensation signal +12/24Vdc Sensor Power Supply Gnd Sensor Power Supply Sensor heating (by external thermostat circuit) Sensor heating (by external thermostat circuit)

Installation

BRINO is provided of a universal bracket that allows the mounting on the horizontal or vertical poles with diameter of $\varnothing 25...43\text{mm}$.

Maintenance

The sensor doesn't require particular maintenance. It is recommended to periodically clean the wet surface and the thermo-hygrometer sensor surface with water and a normal detergent to avoid accumulation of atmospheric deposition or other elements present in the air that could alter the sensor measurements.

