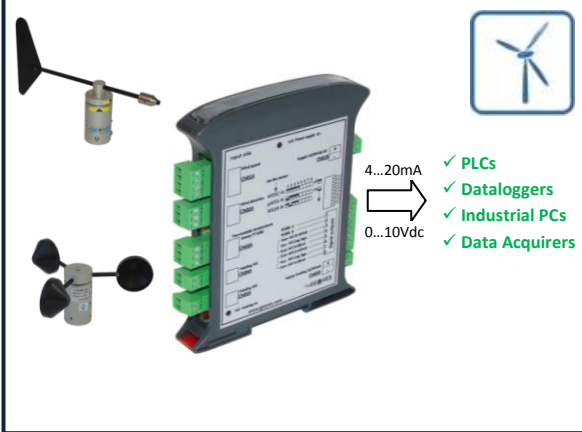


IAN420-2C – Interface for anemometers with galvanic insulation and thermostating system (Rev.3 010917)



Description

IAN420-2C is a galvanic isolation interface that connects 2 anemometers (wind speed and direction) to the most common industrial PLCs with voltage or current analog inputs; IAN420-2C is specifically designed by Geoves to solve the typical problems of **wind turbines**.

Thanks to the internal cpu and the galvanic insulation of the anemometers and power signals coupled with intelligent measurement management, the IAN420-2C is particularly suitable for installations at heights > 20m and in areas exposed to electrostatic and lightning strikes (cableways, lighthouse towers, lattice masts, etc ...). Interfaceable anemometers can have frequency output (speed sensor) and potentiometer (direction sensor); for heated versions in the IAN420-2C interface is integrated a thermostat circuit that activates the anti-ice anemometer heater.

ADVANTAGES AND MAIN CHARACTERISTICS

Reliability and minimal maintenance



- ✓ **Galvanic insulation and power supply stabilization** avoid over-voltages over both the power supply and the signal of anemometers



- ✓ Signal conditioning electronics take place inside the board and not directly in the anemometers: this design assures greater immunity to sensor failures and consequently less interventions on the wind turbine hub (or on the top of the structure where anemometers are installed)

- ✓ IAN420-2C has optical galvanic isolators and a power supply stabilizer / limiter; No other external dischargers or interfaces for anemometers are required

Intelligent management of anemometric measurements

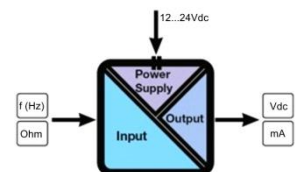


- ✓ The integrated cpu allows optimal management of the anemometric measurements, avoiding errors (bending, spikes, etc.) caused by the turbulence created by the passing of wind blades near the sensors



Compatibility

- ✓ The IAN420-2C generates 2 analog outputs available in current 4...20mA or voltage 0...10Vdc compatible with the most common commercial PLCs and industrial datalogger. Other types of outputs (eg 0...5Vdc, 0...20mA, etc ...) are available on request.
- ✓ Standardized Power Supply 12...24Vdc $\pm$ 10%



Integrated thermostating system



- ✓ The IAN420-2C has a thermostat that automatically controls the heating of the anemometer ice-heater (heated version WS2R and WD2R). This control is carried out by sensing the temperature generated by a Pt1000 sensor integrated in the Geoves anemometers.

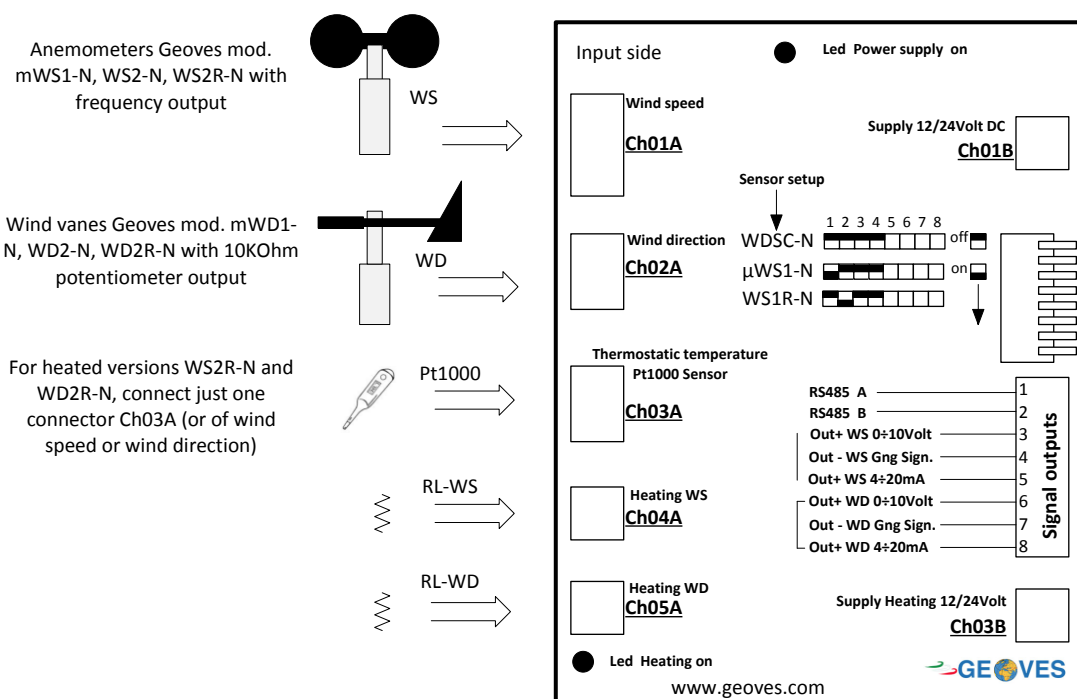
Main applications

- 1) **Wind turbines** (recommended for anemometer installations at heights greater than 20m)
- 2) Civil and industrial applications (**chimneys, road bridges, lighthouse towers, cableways**, etc ...)
- 3) **High altitude anemometric monitoring with ice and snow**

Technical Data

Model: IAN420-2C	
Power supply voltage	12...24Vdc $\pm 10\%$
Current consumption	< 80mA @ 24Vdc
n.1 analog input with optical galvanic insulation	5000 Vrms/1 min.
n.1 frequency input with optical galvanic insulation	5000 Vrms/1 min.
n.2 analog voltage outputs	0...10Vdc WS ..WD
n.2 analog current outputs	4...20mA WS..WD
Maximum shunt load	250 Ω @12Vdc
Maximum shunt load	400 Ω @24Vdc
Minimum shunt load	10 Ω
Gnd common for the outputs	Gnd Signal=Gnd Supply
n.1 RS485 serial output **	RS485 multi-drop
Temperature sensor for thermostat	Pt1000 2Wires 5mt max.
Power for heating system of anemometers	+12 $\div$ 24Vdc DC 2A Max.
Automatic sensors control heating	On <5°C Off >5°C $\pm 0.3^\circ\text{C}$
WD power with the reference voltage	200mV Pot. 1K...50K Ω
Wind Speed signal AC input	Vpp 100mV 500Hz
Wind Speed input signal square wave	5Vdc 1000Hz
Range of wind direction sensor (WD)	0...359° Nord

Wiring layout



Installation

To guarantee less maintenance in height and a better protection to the external induced noises it is recommended installing the IAN420-2C interface to the base of wind turbine (where usually the PLC/control system of wind turbine is installed) in a place easy to access and far from the electrical engine block installed in the hub.

Installing the **IAN420 protection interface to the base of wind turbines**, the following **benefits** are obtained:

- Technical interventions in height are not required to replace the anemometers because all electronic parts (for signal conversion and electrical protections) are inside the IAN420 interface; in this way, in case of lightning, it's the IAN420 which intervenes to save the anemometers, so possible damages will occur mainly in the interface.
- Times and costs of maintenance interventions will be reduced. An height intervention requires more time, tools, professional qualifications and devices then a simple intervention from the ground by a electrician.
- Greater protection from electro-magnetic noises induced from electrical engine of the wind turbine

Furthermore to achieve an optimal working of the system, we recommend the following plant measures:

1. For the link from the anemometers and the IAN420 interface it's recommended using shielded cables without intermediate interruptions; in this way it is ensured a greater protection from external electromagnetic noises. Furthermore it is recommended the use of Geoves cables cod. CSxx already provided of IP68 connector (sensor side) and pins (IAN420 side); this solution ensures the correctness of connections because all cables provided by Geoves are tested in laboratory before the site installation
2. Make a good grounding system at the base of the turbine by checking that the value of the earth resistance on the earth rod is $<40\Omega$
3. In sites particularly sensible at the direct lightning becoming form the sky, it is recommended using a lightning rod which save the anemometers above the hub; this solution will attract thunderbolts onto the rod and discharge them directly to the grounding system (see. point 2)

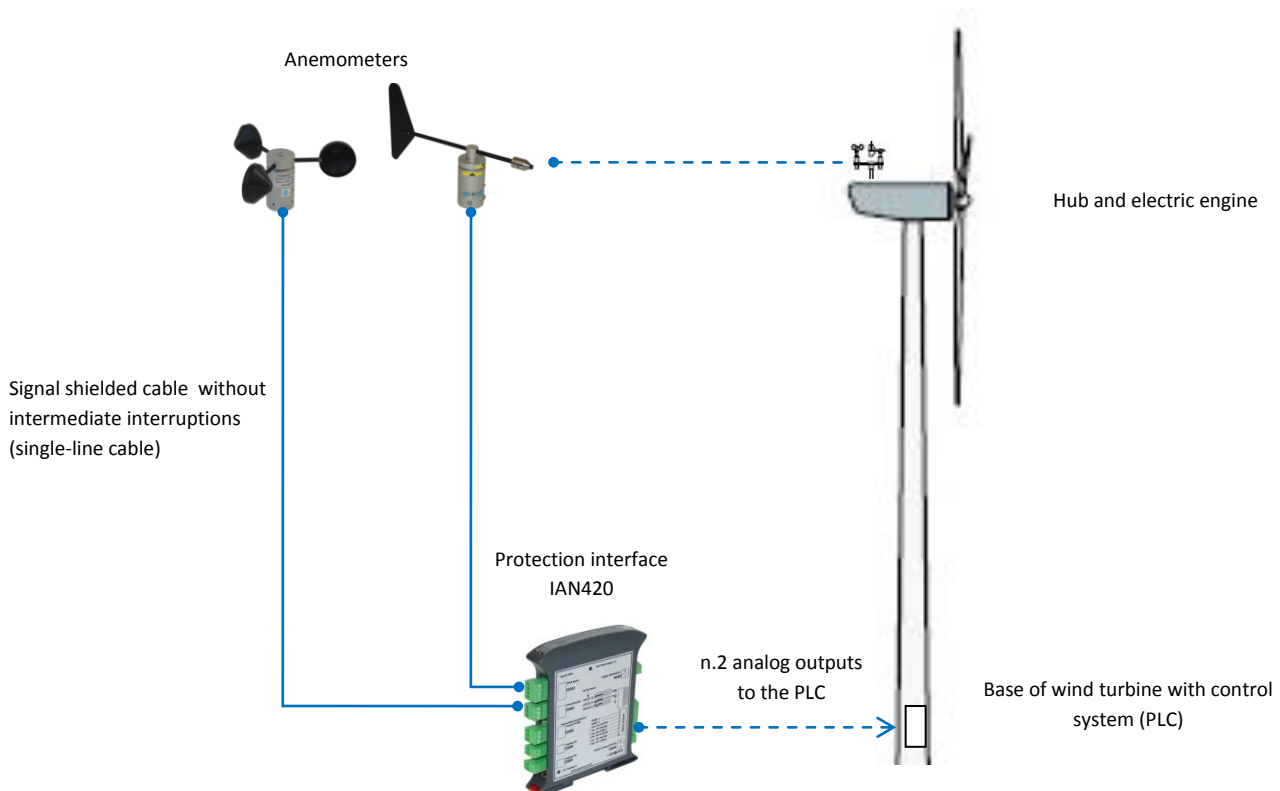


Figure 1 –Recommended mode of installation of the anemometer protection interface