

PG4i

STAND-ALONE RAIN GAUGE

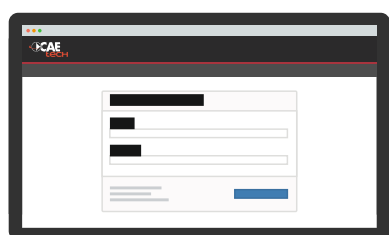
Your professional all in one rain measurement system

PG4i is a **stand-alone rain gauge** that does not require connection to a datalogger. Due to the **built-in mobile modem**, it can measure, locally record and automatically send to a FTP server all data pertaining to the **overall precipitation** as well as its **intensity** per minute.

Due to the **low consumption**, the **standard batteries** that supply power ensure operation without interruptions for very long periods of time, while simplifying the installation as much as possible. It is a particularly accurate rain gauge capable of indicating possible malfunctions before they cause the measurements to stop, therefore it is particularly easy to maintain. The sensor has a captation surface of 400 cm².

EASE OF USE

After receiving the PG4i stand-alone rain gauge, just register it on the <http://support.cae.it> web site and insert the batteries, in order to start receiving data.



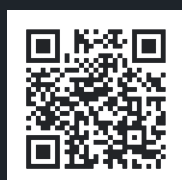
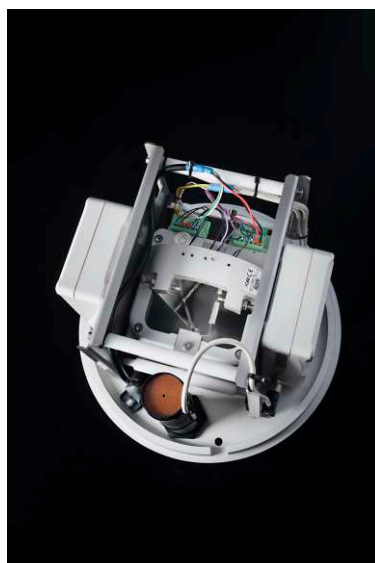
Register your product



Power it up



Enjoy your data



CUSTOMISATION

The **configuration** can be performed remotely **via web** or **locally**, by physically connecting to the PG4i and using the configuration software that is freely available.

What can you customise?

1) FTP service, data display

By default, data are sent to a FTP server provided by CAE, which allows displaying them through AEGIS, a **2D and 3D web software** that can show the position of the rain gauge on a map, as well as the data sent by the rain gauge both as a chart and as a table. As an option, the user can set its own FTP server as destination for the data. Finally, it's possible to receive data and alarms also through a dedicate app.

2) Connection service

By default the rain gauge is delivered with an in-built SIM that connects to the strongest signal and does not require to enter any type of information. However it's possible to replace this SIM with any other commercial SIM card available on the market.

3) Data sending mode

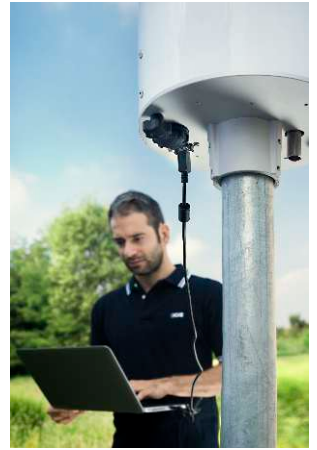


It's possible to choose between two data sending modes:

- **Static mode:** the rain gauge sends data always at the same intervals regardless of any current weather event.
- **Dynamic mode:** the rain gauge increases the sending intervals during precipitations.

In both cases it's possible to select whether to use a low, medium or high **transmission frequency**.

The rain gauge is designed to ensure **low consumption**, allowing the batteries to last for long. The duration of batteries varies according to the mode and data sending intervals chosen by the client.



PG4i - STAND-ALONE RAIN GAUGE

Power supply

The PG4i rain gauge is designed to be powered by 3.6 V lithium batteries for professional use, available in various on-line sites. The rain gauge can ensure a long duration of its batteries without requiring solar panels or mains power supply (220V). However, if the client prefers, the rain gauge is also compatible with power supply via a normal 12 V battery that in turns can be connected to a solar panel system or to the mains power.



EASE OF MAINTENANCE AND "ZERO BREAKDOWN TECHNOLOGY"

Thanks to the tipping technology, the PG4i rain gauge empties itself and requires very **little and easy maintenance**. The sensing element is a reed which is redundant to ensure continuity of operation in case of failure. The sensor also implements **innovative diagnostics**, with the objective of reducing downtime due to faults. Among these are:

- The check for clogging of the funnel that directs the water into the tipping mechanisms;
- The "electronic spirit level" for correct inclination of the instrument with respect to the ground;
- The correct functioning of the sensing elements (reeds) that count the movements of the tipping mechanism;
- The good condition of the tipping group and the moving parts.

NOT ONLY CUMULATED RAIN BUT ALSO RAIN INTENSITY

Although powered by batteries, the PG4i rain gauge allows **accurate measurement both of cumulated rain and rain intensity**. On-board electronics calculate the correction factor to be applied each time the container tips, in order to obtain the correct rain intensity value. This software correction allows effectively compensating the intrinsic error of tilting rain gauges, an error that increases with the increase in intensity.

The intensity of rain, measured by the sensor based on the tipping of the container, indicates the real intensity of rain every minute. It is expressed in mm/h, with an output resolution of 0.1 mm/h.

The tool provides data in mm/h, this value corresponds to the intensity in one minute extrapolated to one hour, and it is supplied every 60 seconds.



Sensor type	Tipping bucket rain gauge with built-in GPRS
Collecting area	400 cm ²
Measurement range	Up to 600 mm/h
Output Resolution	0.1 mm
Accuracy	Max 3% <350mm/h Max 5% 350÷500 mm/h Max 10% 500÷600 mm/h
Temperature Range	+32°F ÷ +140°F (0 ÷ +60 °C)
Powered by	C-size - 3.6 V Primary lithium batteries
Expected battery lifetime	> 1 year
Installation	On mast - On the ground with the relevant accessory

RESPONSE PRECISION AND SPEED

PG4i measures liquid precipitation with an **output resolution of 0.1 mm**. The **maximum error is <3% 350 mm/h, maximum 5% between 350 and 500/h and maximum 10% between 500 and 600 mm/h**. On request it is possible to make selections of more performing products.

Overcoming one of the limitations of weight-based rain gauges, PG4i measures with this degree of accuracy from the first minute following the phenomenon detected, thus being particularly suitable for the timely measurement of downpours.

THE UNI EN 17277:2020 STANDARD

In 2020 the UNI EN 17277:2020 standard was approved as part of the European standards which incorporates a large part of the UNI 11452: 2012 standard previously in force in Italy and regulates the meteorological requirements for sensors dedicated to measuring intensity of liquid precipitation at ground level. It defines a classification criterion for sensors, based on the assessment of measuring accuracy.

This standard is the first European reference for defining the performance of rain gauge sensors. It is the result of the experience gained by the Italian Air Force Meteorological Service and the University of Genoa during the activities performed within the framework of World Meteorological Organization (WMO).

According to the norm, each rain gauge sensor can be classified in a specific category based on specific performance accuracy, expressed in terms of maximum error detected.

The standard defines 3 reference classes: A, B and C. **PG4i**, manufactured and tested by CAE in accordance with such procedures, **are certifiable in class A**, thus representing the best available technology on the market.

THE TESTING MACHINE



In order to certify the effective and correct calibration of its rain gauges in compliance with the new standard, CAE has produced an "automatic" machine for calibration of rain gauges that implements the provisions of the UNI EN ISO 10012:2004 standard.

First of all, thanks to a reference generator, that is device that generates constant water flows, the machine makes it possible to know the exact time taken to tip each container, thereby allowing a perfect balancing of the two pans.

Therefore, it is possible to verify the output of the rain gauge at constant flows, setting the machine at several different intensities of simulated rain, as stated in the standard.

The testing machine allows CAE to certify rain gauges delivered to its clients with a complete calibration certificate and consequently provide clients with the certainty that they are buying a high quality, precise and reliable sensor.



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