




RTCP ML



RTCP - Real-Time Critical Point System is the solution for the **automatic and continuous pressure control** at critical points (CP) in water districts, based on Machine Learning algorithms that estimate the pressure at the virtual critical point.

By **acting** on pressure-reducing valves (PRV), it adjusts the network parameters to match actual demand and maintains optimal conditions in the **Pressure Management Zone (PMZ)**.

The solution learns the network's behaviour from field data and allows the pressure to be adjusted without the need for direct, continuous measurement of the critical point. The system consists of:

-  **Machine Learning Algorithm** (central side): learns the network's behaviour at the critical point, updates the model and makes it available for automatic or manual transmission to the peripheral controller.
-  **Peripheral controller:** an active component that acquires the model's pressure and flow rate data and applies corrective control action to the PRV;
-  **Peripheral at the critical point:** a passive entity that acquires and makes available the pressure data at the critical point

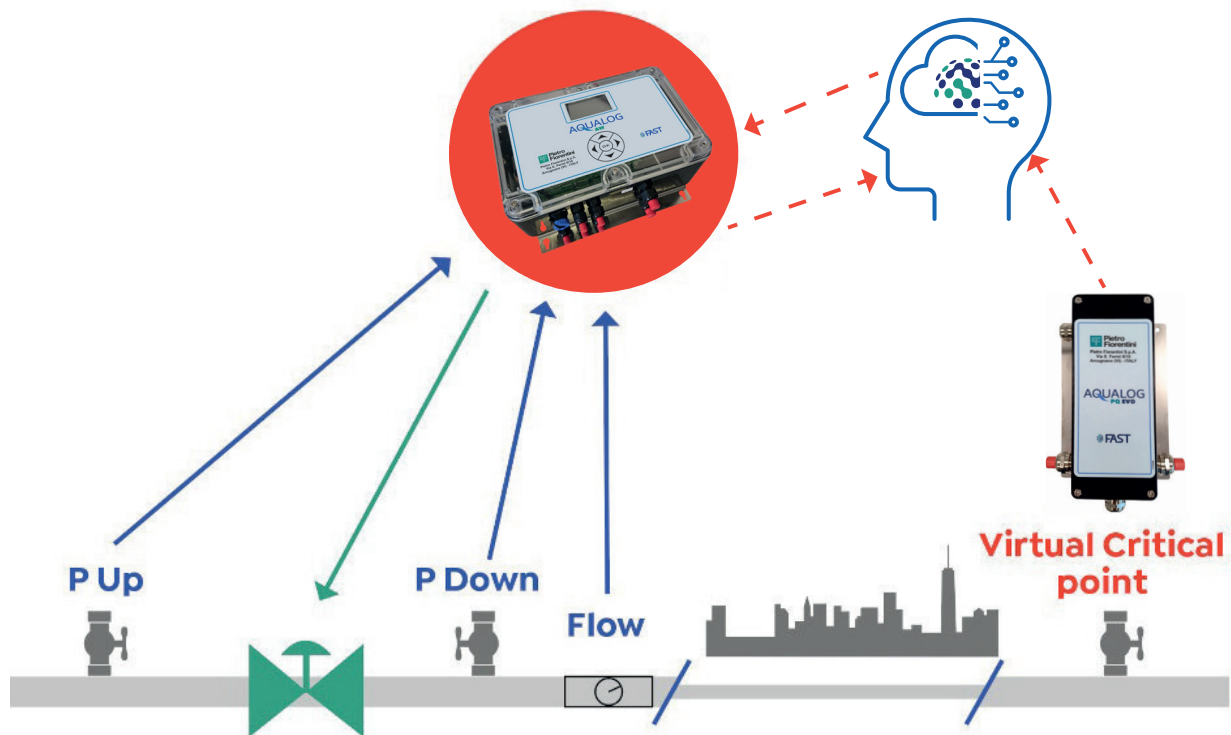


Diagram 1 RTCP ML functional diagram

RTCP: features and advantages

The solution supports the operator in actively managing pressure, combining real-time regulation and predictive analysis to reduce leaks, faults, network stress and energy consumption:



Predictive regulation at the virtual critical point

It predicts the pressure at the virtual critical point and automatically adjusts the PRV set point to maintain optimum conditions in the PMZ.



No dedicated point-to-point channel

The peripheral controller does not need to receive continuous readings from the critical point: this eliminates point-to-point communication issues and the associated energy consumption.



Evolutionary and robust algorithm

The Machine Learning model adapts daily to new data and remains robust even in the event of partial data loss from one or both peripheral devices.



Reduction in leaks and costs

Pressure optimisation helps to reduce water leaks, energy consumption and the PMZ's operating costs.



Easy to set up

The operator sets the pressure value to be maintained at the critical point; the control logic automatically manages the adjustment.



Operational reliability

Back-up strategies ensure that pressure control is maintained even in the event of instrument failure, guaranteeing service continuity.



Monitoring and integration

An intuitive web interface, automatic notifications and integration with leading SCADA systems make PMZ management more effective.