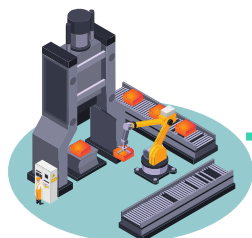


Monitoring IoT 5.0



IoT system for monitoring the consumption of energy carriers and calculating **performance indicators, sustainability indices and KPIs** linked to production volumes



plant or process



IoT
Gateway



Web interface

Our Internet of Things system



monitoring electrical panel

Optimo IoT Gateway **AssetLinker 300**

Our IoT gateway acts as a central node for collecting, processing and transferring to the cloud the data coming from devices and sensors distributed across the plant

- WiFi, LAN or 4G connectivity
- Modbus, OPC UA, BACnet acquisition
- Direct integration with Siemens PLCs
- Analogue and digital inputs and outputs
- Web server for offline use
- VPN for remote service
- Local storage (data logger)
- Data exposed to PLCs and controllers

Optimo IoT Web interface

Our platform for viewing and managing data from the IoT gateway in the cloud. It lets you monitor machine status and performance in real time, and also interact with and control the process

- user access via web interface
- real-time monitoring
- remote management and plant optimisation
- logging of historical operating trends
- Email or SMS notifications
- API for communication with other clouds



Optimo IoT web interface

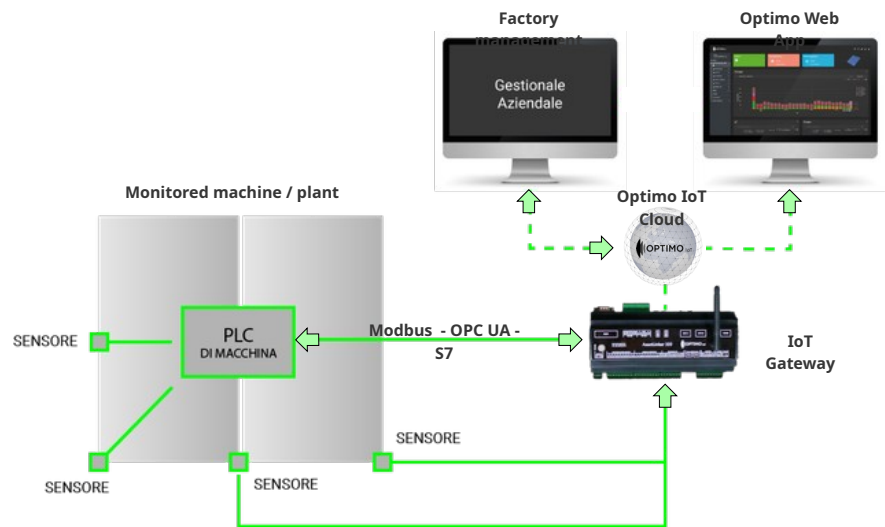
Data acquisition and exchange with factory systems

Communication with factory machinery

Plant machinery sends data to the IoT gateway via the **Modbus** or **OPC UA** communication protocol, or through the machine **PLC**.

The IoT gateway receives this data, processes and stores it locally, and transmits it to the web interface, to the **factory management system** or to suppliers' management systems.

Communication between the gateway and the cloud uses the **MQTT** protocol over WiFi, Ethernet or 4G mobile networks, enabling remote control and monitoring of the system.



Integration with generic devices **Advanced configuration**



Siemens PLC

Direct read and write of Siemens CPU data blocks (DBs). Support for basic and custom data types. Configuration interface designed to make commissioning easier

- S7 protocol
- Support for S7-300, 1200, 1500



Modbus TCP & RS485 modules

Read and write of generic Modbus TCP and RTU devices. Support for all Modbus functions. Quick read and test tools for commissioning

- Custom register entry
- Support for any encoding
- Read test tool



OPC UA Server

Easy integration, even with DCS. Variable browsing, support for complex structures, authorisation and encryption

- Node browsing
- Access to complex structures
- Subscription or polling



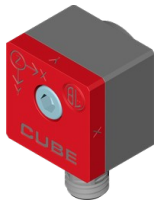
Generic LoRaWAN device

Acquisition of readings from third-party LoRa devices, with configurable data decoding functions

- Variable selection from payload
- Integration of existing devices

Integration with generic devices **Plug&Play**

Optimo IoT offers a simplified interface for connecting to a number of specific devices. In a few clicks, simply by selecting the variables of interest, you can add them to your dashboards without having to study their manuals. Here are a few.



CEMB Cube vibration sensor

Measures the **vibration of machinery and rotating equipment** to monitor operating condition and prevent damage or malfunctions.

- Machine protection
- X, Y and Z axis vibration
- Temperature measurement
- FFT waveform analysis



Algodue UP209 power analyser

Monitors the **energy consumption** of electrical loads, revealing their load profile and calculating the energy footprint of production.

- Measures V, A, W, kWh
- Measures $\cos \varphi$
- Rogowski coils or CTs



Overdigit EX04AIO analogue I/O module

Acquires and transmits analogue and digital signals for process monitoring, sensor integration and plant control.

- Digital inputs and outputs
- Analogue inputs 0/10V 4-20mA
- Analogue outputs 0/10V
- Pt100, Pt1000, NTC probes



Telematica MB880-X utility meter module

Monitors the energy consumption of electrical loads by reading data directly from the utility meter. Reveals their load profile and calculates the energy footprint of production.

- Measures V, A, W, kWh
- Measures $\cos \varphi$
- custom K factor entry



SMC AMS leak control unit

Monitors machine stand-by conditions (when production stops) and automatically reduces pressure. Cuts unnecessary air consumption.

- Dedicated dashboard
- Operating mode statistics
- Command sending



Milesight CT101 LoRa current transducer

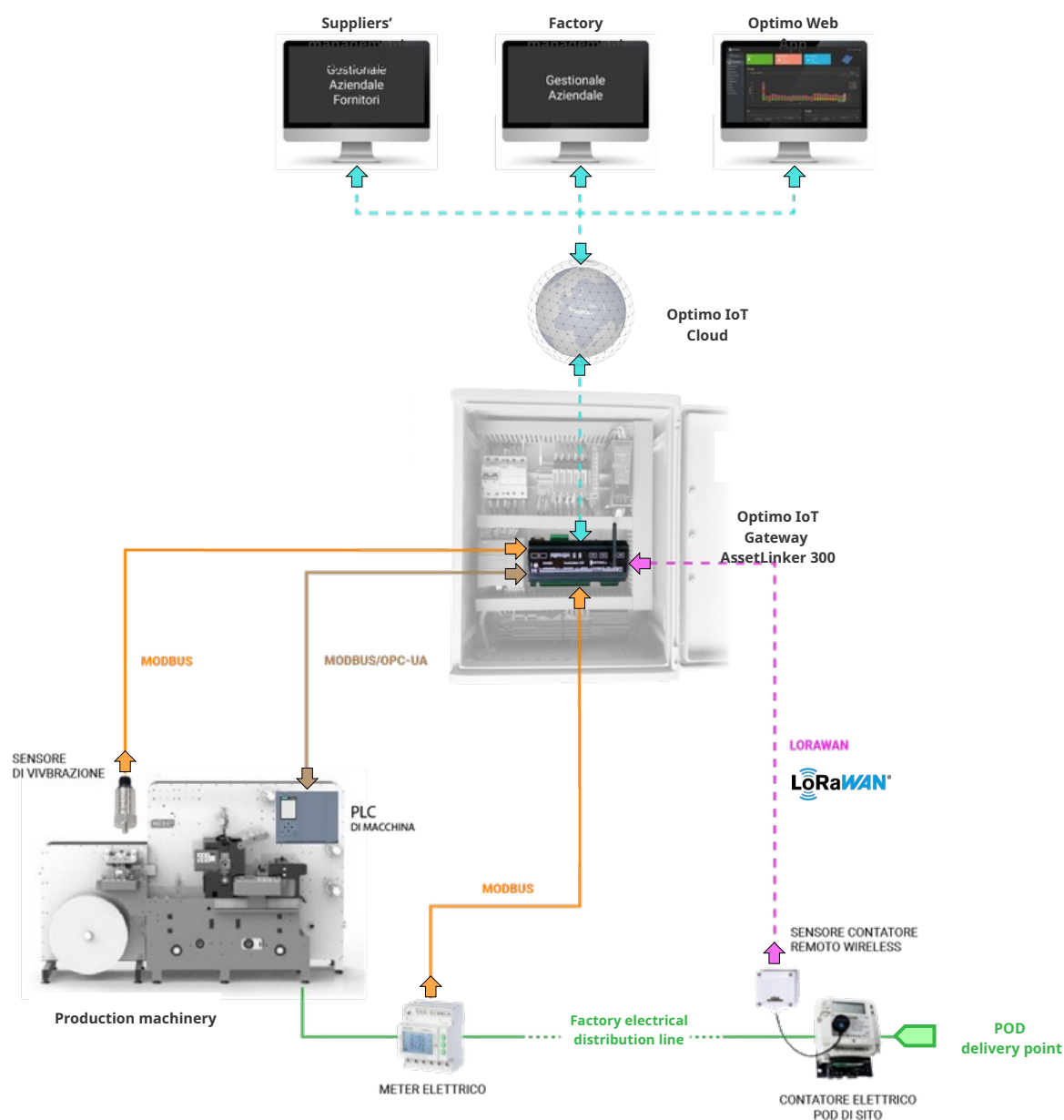
Monitors current consumption with no wiring at all. The module is powered by the CT itself and needs no battery

- Measures A and Ah
- data sent every minute

And many more!

System architecture Internet of Things 5.0

Architecture of a machine monitoring system



Monitor the system and calculate **site and process ENPIs** in real time on our dashboards, available in the cloud and locally. Receive custom periodic reports by email

