

# Digitizing Analog Measuring Points for Wireless Monitoring - Neuron mA Digitizer

In many industrial settings, precise and reliable monitoring of various processes is essential for safe and efficient operation. To achieve this, it is common to use analog signals of 4-20 mA to transfer status data from various types of sensors to control systems. Digitizers play a critical role in this context by converting signals from analog 4-20 mA signals to digital data that can be processed and analyzed by modern control systems. There are several types of industrial equipment that utilize 4-20 mA analog signals, such as:

1. **Flow Sensors:** Used to measure the flow rate of liquids and gases in pipes, found in industries like oil and gas, water treatment, and manufacturing.
2. **Level Sensors:** These sensors measure the level of liquids in tanks and are vital in industries like the food and beverage industry, water treatment, and chemical production
3. **Particle Sensors:** Oil and hydraulic systems are monitored using particle sensors that measure and count particles in the liquid to maintain the desired quality in relation to specific requirements.

## Challenge

Analog measurement points on machinery in industrial environments present several challenges:

- Wiring and maintenance of analog sensors introduce both complexity and costs,



especially if the sensors are located in inaccessible places.

- Manual reading and recording of values from analog sensors lead to less organized data processing. The data retrieved from the equipment won't be stored historically unless manually registered into a system, providing a worse basis for maintenance decisions.
- Additionally, the use of purely analog measurement points limits the possibility of integration with more modern digital monitoring systems, offering fewer opportunities for remote monitoring and condition control.

## Solution

- With the Neuron Digitizer, you can convert analog signals to digital signals, eliminating the need for extensive cabling, resulting in reduced complexity and lower costs.
- The 4-20 mA analog signal from the sensor is read and converted to the desired measurement in the Neuron app, which is displayed in graphs and used for notifications. For example, a Neuron Digitizer mA mounted on an analog flow sensor will receive a signal between 4-20 mA, which is converted to flow rate.
- The table below shows an example of how the signal is converted to flow rate in a flow sensor that can measure up to 40 L/min.

Analog signal	Calculated value (%)	Calculated value (L/min)
4 mA	0	0
8 mA	25	10
12 mA	50	20
16 mA	75	30
20 mA	100	40

Relationship of analog signal and calculated value

- Thanks to the sensors' compact and wireless design, they can be easily installed in less accessible locations.
- The Neuron Digitizer transmits data in real-time to the Neuron App, enabling remote monitoring and condition analysis.
- Through the Neuron App, integration with other monitoring systems via API is also possible.
- This makes the Neuron Digitizer a key component for modernizing industrial operations and facilitates the transition to a more data-driven and automated approach to condition monitoring.
- In addition to the Digitizer mA, El-Watch offers Digitizers that capture mV or VDC signals, allowing data from multiple signal sources to be digitized.

## What you get

- A Neuron Digitizer that is easy to install, converts analog signals to digital data, and transmits the data wirelessly.
- Conversion of analog signals with a measuring range between 0-25mA, 0-250mV or 0-30V/ VDC.
- Continuous measurement with immediate alert on significant changes in signal values, based on your own alarm values.

- Adjustment of parameters such as measurement frequency if needed.
- Set your own alarm levels through the Neuron app, with the option for alerts via email and/or SMS.
- Increased security and efficiency by having access to accurate data, enabling optimized operation and maintenance of machinery.
- Become part of the move towards Industry 4.0 by digitizing existing systems and avoid cabling through user-friendly wireless IoT technology.

## Products in use

