

CONTROL IN PROCESS INDUSTRY FACILITIES: PROPOSED DISPLAY OF THE STRUCTURE OF INPUT VALUES

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Control in process industry facilities today is based on programmable logic controllers (PLC) for process control and SCADA (Supervisory Control And Data Acquisition) systems for monitoring and controlling the process. Process control is the generation of control signals, which control actuators based on sensor input signals. Signals used for process control and supervision will also be displayed on SCADA devices.

The idea is to propose a single input signal structure covering all control and supervision requirements. The idea itself is nothing new, and data structures are used in DCS systems (Distributed Control Systems) as already predefined by the manufacturer. In other systems, the control and supervision software designers are let to design the data structures themselves. Therefore, the idea arose to present such a structure as a starting point.

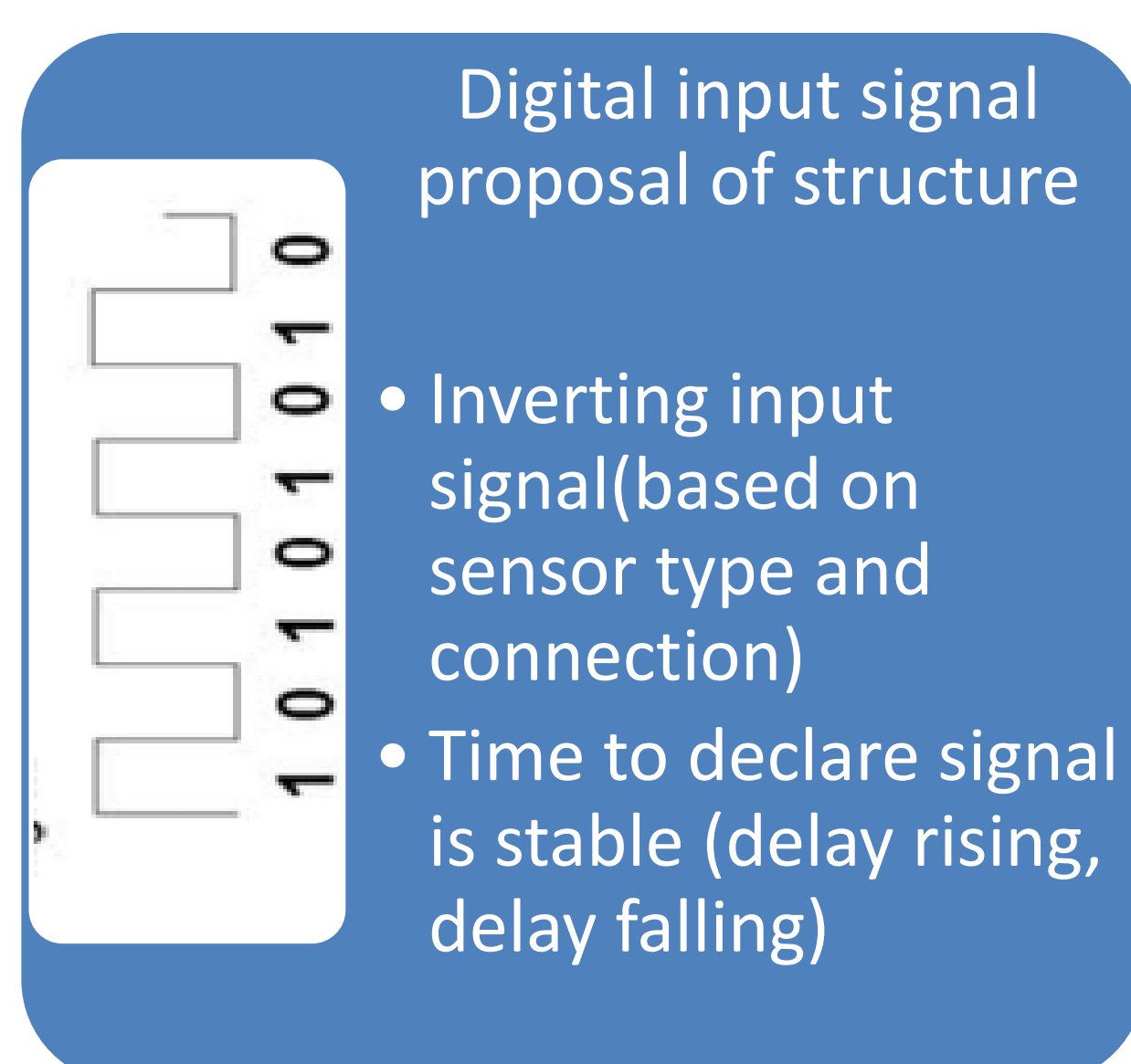


Fig. 2. Proposed structure of the digital input signal

Analog signals have a discrete set of values for which they would predict corresponding threshold values. They could be defined as very low, low, working, high and very high, indicating that the appropriate value level has been reached. In addition, getting a value or falling below a particular value could be conditioned by time. After the expiration of a specific time, it is declared it has been reached.

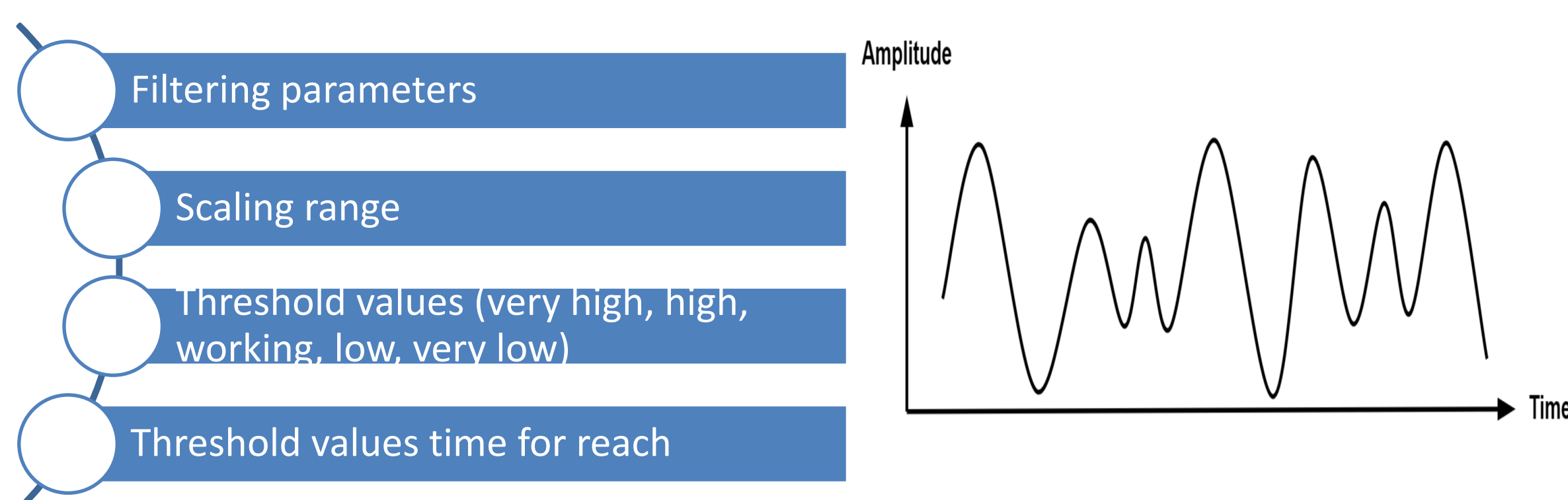


Fig. 4. Proposed structure of analog input signal

CONCLUSION

The proposals are only the first step towards coming up with a solution for processing and displaying input signals in process industry plants to find a relationship between the size of the structure and the ease of its application versus the intended functionality.

Key words: digital inputs, analog inputs, SCADA

Acknowledgment: This research (paper) has been supported by the Ministry of Science, Technological Development and Innovation through project no. 451-03-47/2023-01/200156 "Innovative scientific and artistic research from the FTS (activity) domain".

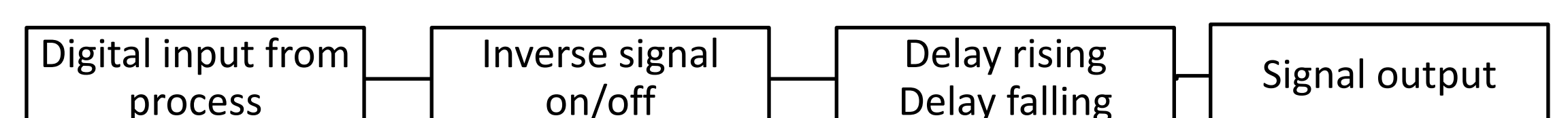


Fig. 1. Schematic of processing digital input signal

Input signals can be divided into

- digital, which has only two possible state values and is processed as is show on figure 1.
- analog, which has more discrete states after discretization and can be process on way presented on figure 3.

The proposal for the structure of the digital input signal would consist of the fact that the input signal needs to be processed to enable the signal to propagate in time. Taking a certain amount of time for the signal, stable at one of the values, to declare that value has been achieved. The structure must also allow inverting the input signal since the need to invert the input signal arose due to the type of sensor itself. Show the proposed structure on figure 2.

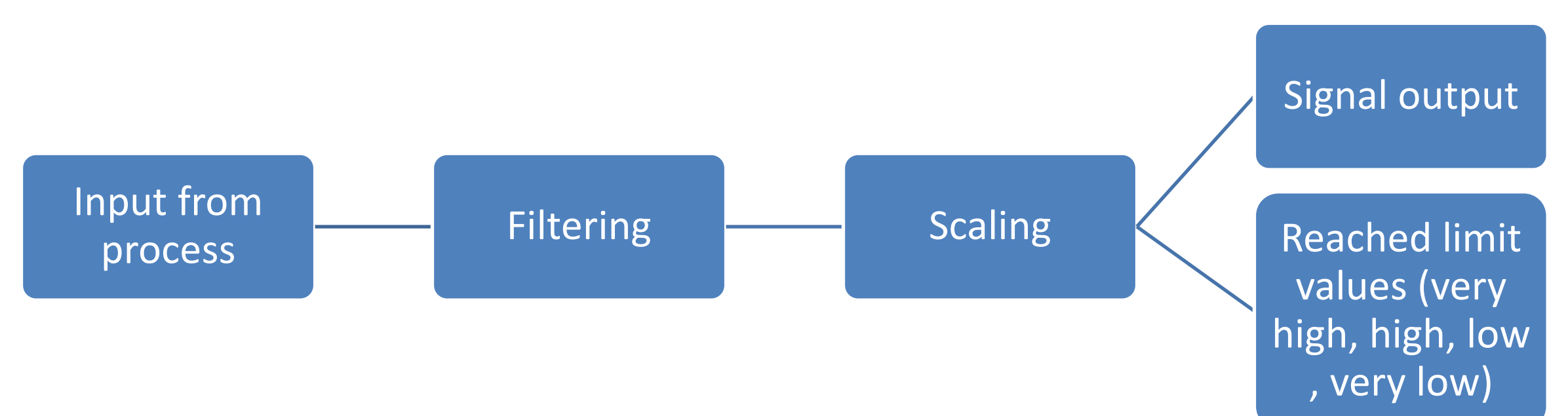


Fig. 3. Processing analog input signal

Discrete values can oscillate due to measurement conditions, technical measurement limitations, and the process. Therefore, it is necessary to add some way of signal filtering to the structure, e.g., mean value or similar. The processed signal should be adapted for display in the process monitoring and control system. Therefore, it should be possible to perform linear scaling of the processed signal with the input of the scaling range. On figure 4. it is proposal about structure of parameters for analog inputs.