How autonomous are today’s industrial systems?

Can a production facility’s level of autonomy be compared to the levels of autonomy now generally accepted for vehicles? Far from being an apples-and-oranges comparison, these two application areas share a world of similarities – thus shedding light on the meaning of autonomy itself.

Everybody’s talking about autonomous systems as they apply to cars. But what’s the status of these systems in industry? While the US National Highway Traffic Safety Administration (NHTSA) has established very clear definitions of the five levels of autonomy [1], similar definitions in the field of industrial automation are yet to be set. Nevertheless, these two application areas can be readily compared.

But just to avoid confusion, it must be clear that automation and autonomous systems are two substantially different animals. Simply put, autonomous systems are characterized by the ability to act independently of direct human control, whereas automated systems are not.

In both, engineering and operations cases, the objective is the same: to eliminate the need for human intervention through the increasing application of machine learning.

In view of these circumstances, it can be expected that artificial intelligence will change today’s control paradigm from signal marshalling to process data analytics, from feedback loops to prediction, and from process calibration to self-optimization. Looking ahead, engineering, operation and control will merge in tomorrow’s autonomous systems into a continuous cycle of self-learning algorithms that will enable process and plant optimizations we can hardly imagine today.

In terms of operations, Level 3’s industrial counterpart can be described as follows: The human operator must be ready to take back control at any time when the autonomous system requests the human operator to do so.

References

01 An ABB FlexPicker robot. The algorithms driving such machines are helping to maximize flexible and hygienic processing of foods.

02 An industrial engineer, the objective is to eliminate the need for human intervention through the increasing application of machine learning.

03 In industrial engineering, the objective is to eliminate the need for human intervention through the increasing application of machine learning.