In many cases, the control architecture integrates a so-called Master Station. It is an interface located between the DCS and the actuators. Selecting the right technology for this communication link is critical. The scope of this article is not to build an exhaustive list of all the parameters to be taken into account such as, for example, response time, MTBF (Mean Time Between Failure), etc.

Three points are explained below as they are of high importance for site engineers, but often neglected at the design stage.

Flexibility
To manage fieldbus communication, there exist two types of buses. A “proprietary” system compels customers to use compatible devices supplied by the same manufacturer, whereas an “open” system allows the connection of several brands of actuators or sensors to their fieldbus, and consequently, to choose freely the equipment supplier. Opting for an Open system then confers to the user's installation much more flexibility and eases site management.

Reliability
Most fieldbus systems clearly offer a good level of reliability. Availability rates higher than 99.99% are common on redundant PLC-based fieldbus communication systems. Profibus or Foundation Fieldbus also provide a high level of functional safety. The reason is the permanent checking of communication. A fault is immediately reported and can be repaired promptly.

The security is critical for complex process. Therefore, in some cases, security level has to be further raised by using a full redundant communication between the Master Station & slaves. In fact, system redundancy by doubling the fieldbus lines...

Features of Bernard Controls' new Master Station
- PLC technology
- Open protocol Profibus DPV1
- Up to 120 actuators and 10 km
- Maximum scan time of 3 s.
- Up to 3 starts of line
- Line & system redundancy
- Non-intrusive setting & intuitive interface based on INTELLI+® technology
- Bus continuity during maintenance operations

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and interfaces reduces to almost zero the risk of communication failure. However, there can be a case where the continuity of the two lines can be disrupted at the same time: when one actuator is being retrieved from the field for maintenance, the whole installation is affected since the signal cannot circulate anymore. It is therefore very important to make sure that, when an actuator has to be removed from the field (i.e for repair or replacement), there exists a technical means to secure the line continuity.

Efficiency
Digital communication allows the user to retrieve a large quantity of information from the field units. This is all the more valuable as it is combined with high speed of communication. A response time of a few seconds to command and receive all information of tens of devices over a distance of 10km is achievable.

The Master Station is generally located close to the field units and therefore represents a good access point to the MOV data for the maintenance engineers. This type of interface is designed to work with actuator intelligent control technology, thus supplying a great deal of information, of which key data for maintenance operations:
• valves torque curves
• number of travels
• running time
• log of alarms
• status of communication between the devices…

The availability of these data can be very useful to support preventative maintenance management and finally help reducing process down time and increase plant availability.

Sum-up
Performance of a Master Station remains the key of selection. Moreover, it contains features that bring the site management to a higher level because of additional flexibility, reliability and efficiency.

About the authors
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Mr Fabien Lemaitre is Bernard Controls’ Marketing Manager. Graduated from an M.S. in instrumentation, he arrived in the company in 2002 and relies on 20 years of experience in instrumentation & controls to coordinate all the marketing activity of the group. As a European standardization expert (valves & actuation), he keeps in touch with the latest innovations and standards in actuation technology, so as to determine the most accurate & efficient global marketing strategy.