

104a Issues in Using Wireless Devices in Industrial Control Systems

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Wireless devices are making their way into Industrial Control and are being considered as alternatives to wired devices, in new installations and in expansion of existing installations.

When compared with wired devices, wireless devices have a number of advantages such as, ease of installation, mobility, flexibility, scalability, configuration and maintenance.

However, because of interference, power and bandwidth constraints, undesirable effects such as latency and packet loss, are introduced when these devices are used. There is lot of debate within the industrial control community about whether it is appropriate to use wireless devices in these systems. Uncertainty about this technology, which is partly due to the stochastic nature of these networks, has led to hesitancy among the user community, in using these devices.

Some of the disadvantages of wireless systems are, lack of determinism, uncertainty about their reliability and security. Wired systems on the other hand, provide all these features, which makes them suitable for control requirements. Given that there are advantages and disadvantages in both these technologies, it is likely that future solutions will consist of integrated systems, in which wired and wireless devices co-exist in the network. In such a scenario, it is important to ensure seamless integration of wired and wireless devices. Towards this objective, we analyze existing industrial networks, including Foundation Fieldbus, HART, Modbus, etc., identify critical issues which arise in integrating wireless devices with these wired networks, and discuss the modifications required to achieve this integration.