Wireless Devices in the Factory Automation – An Overview of Adoption Trends

Khadambari Shanbagaraman  
Research Analyst  
Industrial Automation & Process Control  
Frost & Sullivan

Wireless devices are perceived as the next big technological wave in factory automation. However, the current adoption trends are moderate at best despite requirements for real time data, mobile workforce, remote access and flexibility in operation. This is mainly because the wireless devices are not found to be robust enough by end users due to concerns such as reliability, security and interoperability.

Concerns using Wireless Devices

Major concerns towards wireless adoption in factory automation are reliability and security. End-users perceive that for a plant to operate round-the-clock, the current wireless technology does not provide the necessary robustness. This is mainly because of the possibility of many technical issues such as signal mismatch, electromagnetic induction, data loss in transmission, and other interference problems, that are quite common in a factory automation environment. For example, in industries such as automotive and plastics, inconsistent wireless connectivity occurs due to disturbances from metal grids present in the plant. Data transmitted wirelessly can be easily hacked and hence, must be properly encrypted and decrypted for secured transmission. Additionally, end user conservatism, which is evident in industries such as food and beverages and plastics, is restraining investments into wireless devices as the end users are less willing to implement the new technology without being assured of its potential benefits. Many end users indicate that they might jeopardize their current operations if they shift to this new technology. There are also other concerns, such as high initial investment cost, lower battery life of the devices, interoperability of the device and non-uniform wireless standards, which are currently hampering wireless device adoption.

Key Reasons for Wireless Adoption in Factory Automation

The key reason for wireless adoption in factory automation is the need for real time data and work force mobility. Wireless devices track the state of the silicon wafers in the semiconductor industry and are involved in the diagnostic testing of the vehicles in the automotive industry. In these two applications the real time data are very crucial, which are efficiently obtained through the usage of wireless devices. End users indicate that constant monitoring of the processes is a major requirement in the factory automation set-up, as this would ensure quality at the end of the every process. Work force mobility is enhanced using wireless devices
such as PDAs in numerous applications which previously required the operator to spend more effort. In packaging industries, the wireless modems fixed to the end users’ machines enable technicians to remotely diagnose and fix machines in case of machine malfunction, and this significantly reduces manual labor. Wireless devices offer greater flexibility and cost-reduction in monitoring and alerting applications. Cabling costs and installation costs are reduced by using wireless technology in the remote applications which are prevalent in most of the industrial segments. Wireless devices also offer the possibility of measurements in areas that are difficult to access by cables such as moving or inaccessible parts. Temperature measurements from furnace or rotating coils present in semiconductor industry are now possible by use of wireless devices. End users believe that the plant performance could be greatly improved with the availability of these untapped critical information.

**Chart 1:1 Wireless devices in the Factory Automation: Key Benefits and Concerns, (Europe) – 2008**

![Chart showing distribution of wireless devices in different industries](image)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile Industry</td>
<td>42.3%</td>
</tr>
<tr>
<td>Food and Beverages Industry</td>
<td>24.2%</td>
</tr>
<tr>
<td>Semiconductor Industry</td>
<td>18.3%</td>
</tr>
<tr>
<td>Plastics Industry</td>
<td>6.5%</td>
</tr>
<tr>
<td>Fabrication Metal Industry</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

**Expectations from the Supplier**

Despite the available potential, the penetration of wireless devices into the factory automation environment has not been up to the expected level. The wireless device vendors must take the first step in addressing all the technical issues surrounding wireless technology. Educating the end-users about the wireless products and their benefits will help in changing their conservative
mindset. This in turn will help the suppliers to learn about the end users’ requirements and would help them in offering the best suited wireless solution. Offering the end users with products for testing and trials is also an important step towards increasing wireless adoption. Overall, the adoption of wireless in factory automation is expected to increase gradually as more and more end users realize the benefits of wireless technology.

*Khadambari Shanbagaraman is a Research Analyst for Frost & Sullivan Industrial Automation & Process Control Group.*

If you would like to have more information on the above subject and related research, please send an email to Joanna Lewandowska – Corporate Communications, at Joanna.lewandowska@frost.com with the following information:

full name, company name, title, telephone number, e-mail address, city, state and country.

Requested information will be sent to you by email.