The Future of Wireless In Industry
Remote 2013
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Agenda

1. IHS & Research Methodology
2. Industrial Communications Overview
3. Wireless Research Overview
4. Competing Wireless Technologies
5. Trends Affecting Growth of Wireless
6. Conclusion and Q&A
IHS & Research Methodology
IHS Overview

• IHS, founded in 1959 and headquartered in Englewood, CO
• A leading information provider
• We are more than 8,000+ people, in 30+ countries, speaking 50+ languages – all working each day to:
  • Serve businesses and governments worldwide
    • 70% of the U.S. Fortune 1000
    • Ranging from 85% of Global Fortune 500 to small businesses
    • Customers in 165+ countries
  • Provide comprehensive content, software and analytics, and expert analysis and forecasts
  • *Helping our customers drive critical processes and make high-impact decisions with speed and confidence*
Research & Methodology

- Industrial communications research completed annually for nineteen industrial automation product groups
- In-House component reports form basis of sixteen groups
  - Each report takes around 4-5 months to complete
  - Analysis of products split by region, country and vertical
- Industrial Communications research examines:
  - Adoption of Ethernet, fieldbus and wireless technologies
  - Product variations and differences between regions (EMEA, Americas, Asia)
Industrial Communications Market Overview

- Market still very fieldbus orientated
- Fieldbus technologies well known and respected
- Ethernet slowly replacing fieldbus
- Speed, ease of use and open data sharing beneficial
- Wireless still very niche but a great network add-on

![Figure: World Market for Industrial Communication Technologies](image)

Market Share of New Nodes

- 26% Ethernet
- 72% Fieldbus
- 2% Wireless

Source: IHS Oct-13
Industrial Communications Regional Perspective

- Regional differences are mainly focused around unit shipments
- EMEA currently highest for new nodes. Growing at 9.3% CAGR
- Asia growing quickly to equal EMEA in 2017. 14.3% CAGR
- Americas new nodes growing at 9.9% CAGR
The Future of Industrial Communications

- Currently a sector megatrend, alongside cyber security and safety
- Increasing pressure from consumer devices for BYOD
- Industrial automation integration will tend towards standardisation
- Fieldbus share of new connections decreasing but still significant
- Wireless a small but important part
Wireless Communications in Industrial Automation

- The market for wireless is small (around 2% of new connections)
- A young market which is still evolving
- A number of technologies competing, with attempts at standardisation

Please Note: All wireless figures are for products featuring embedded wireless only.
Regional Variations in Wireless

<table>
<thead>
<tr>
<th>2012</th>
<th>Americas</th>
<th>2017</th>
<th>Asia</th>
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<tr>
<td>562,100</td>
<td>861,700</td>
<td>821,200</td>
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<td>EMEA</td>
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IHS Electronics & Media
Regional Trends

- **Americas**
  - Smallest market but steady growth
  - New product releases will give growth edge over EMEA

- **EMEA**
  - Strongest new wireless shipments in 2012
  - Slow growth, compounded by un-ease of wireless and slow economies

- **Asia**
  - Strong growth driven by faster industrial growth
  - More automation equipment shipments
  - Generally stronger adoption of newer technologies due to more greenfield sites
Products Using Wireless

• Common devices include:
  – Sensors & Measurement Devices
  – Rugged Mobile Devices (excluding consumer & BYOD)
  – Remote I/O Modules

• Less common devices include:
  – PLCs
  – Industrial PCs
  – Operator Terminals
Product Trends & Applications

• Around 2-3% of new devices are wireless enabled
• Growth is driven by the wider implementation of networking
• Increase in number of wireless devices is forecast to be slow
• Growth expected to be strong for PLCs, Industrial PCs, Remote I/O and Sensors
• Wired backbones with wireless branches are, and will continue to be, most common
• Can reduce infrastructure and maintenance and maintenance costs
Industrial Automation Equipment and IoT

- Overall, equipment growth is slow
- However, growth of networked systems is higher
- Driven by the trend to seek efficiency and reduce downtime
- This means more intelligent equipment is being developed and utilised
- Equipment is more widely connected to the world (wired or wirelessly)
- Wireless offers a great add on for sensors
- Greater efficiency for monitoring and management
Industrial Sectors Using Wireless

• Oil & Gas
  – Sensors & Monitoring
  – Reduces Infrastructure Costs
    • Older infrastructure may otherwise need replacing
  – Possibility for energy harvesting

• Automotive
  – Modular robots/assembly lines
    • Quicker line transformation on new model lines
  – Reduces chances of frayed/damaged wiring
Competing Wireless Technologies
Wi-Fi vs. *Bluetooth*

- The two most established technologies
- Widespread in discrete automation
- Directly compete in a number of areas
- The BYOD trend is helping to boost adoption
- Wi-Fi currently holds the advantage
- To 2017, this gap is forecast to grow
- *Bluetooth* to remain stronger in certain applications
- *Bluetooth* Low Energy is expected to bolster overall *Bluetooth* growth
WirelessHART vs. ISA 100.11a

- The two major industrial technologies
- Both developed for the industrial space
- More common and widely used for process automation
- Forecast to consistently account for over half of new connections in this area
- The recent failed convergence is expected to affect ISA100.11a more than WirelessHART
Trends Affecting Growth of Wireless
Monitoring vs. Control

**Monitoring**
- Offers great flexibility
- Can reduce infrastructure costs
- Can introduce devices easily
- Batteries can cause issues
  - Manpower required to repair/replace
- Mesh-networking can mean low cost, low power networks

**Control**
- Limited market size
- Suitable for outdoor situations (cranes, automated vehicles)
- Reliability more questionable when in busy factory environment
- Can be inherently safe
  - Signal drops, machine shuts off
- Mostly non-critical use
Batteries & Wireless Energy Harvesting

- Usually a device carries a power cable making wireless unnecessary.
- Smaller wireless devices are moving to battery power.
- No standards for batteries is hampering adoption due to unease of future serviceability.
- Industrial environments can vastly shorten battery life.
- Energy harvesting can offer solution.
- Still rather expensive when compared.
- Can be limited in power generation.
Cyber Security

- Security is often overlooked in industrial
  - Passwords are left unchanged or are pinned to machines
  - Firewalls or VPNs are not correctly used
  - Risk assessments not complete
- Wireless networks can be more open to an opportunistic attack
- Training and insight will help in understanding a more secure network
Other Important Trends

- Reliability
- Cost versus a wired network
- Remote Access capabilities
- RFID
- Personal Area Networks
- Scalability
Conclusion

• Wireless to play a more significant role as industry continues to adopt Ethernet.
• Excellent opportunities for extended networks using wired networking as a backbone
• The use of consumer devices and BYOD to bolster the use of wireless access in factories
• Powering of devices is a critical consideration
• Cyber security and issues around it need addressing
Q&A
End - The Future of Wireless In Industry
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