The Connected Industry

Industry 4.0
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Industry in transformation

Change is not just about new things, it’s about how to do things differently. Manufacturing already generates more data than any other industrial sector. Data in Industry 4.0 allows continued process improvement, better forecasting, improved quality, and enhanced customer support.

Predictive maintenance
Monitor connected machines, tools, and equipment on the production floor and predict possible maintenance issues and future behavior based on continuous data analysis.

Remote services
Transmit operational information to partners for remote administration of services, allowing smooth procurement and provisioning of production equipment and material.

Edge computing
Cut costs by crunching data locally and filtering out what really needs to be sent to the cloud. Latency, privacy, and reliability are additional key drivers.

Sensors
Capture all relevant process data to feed artificial intelligence, conduct machine learning, and create digital twins.

Wireless connectivity based on standards like Bluetooth®, Wi-Fi, and cellular air interfaces in industrial operation and workforce collaboration reduces investment cost, speeds up implementation, increases flexibility, and improves scalability, while supporting better information flow and operator safety.

IoT in manufacturing

1. Sensor (Bluetooth low energy)
2. Tag for indoor location (Bluetooth low energy)
3. Nodes for lighting, indoor infrastructure (Bluetooth mesh)
4. Gateway (Bluetooth low energy to Wi-Fi / Cellular)
5. Predictive maintenance of machines and tools
6. Sensor in parcel (with Bluetooth low energy, GNSS for position tracking, cellular for reporting information)
7. Remote cellular monitoring of equipment and material
8. Remote access to manage factory and production assets
Why u-blox?

As the world becomes increasingly connected, wireless modules and chipsets are critical components to connect manufacturing plants and equipment. Choosing the right supplier to ensure a properly functioning, secure and sustainable module for your Industry 4.0 application is an important business decision.

Longevity
Serving industrial customers isn’t just about developing and selling silicon. Industrial modems have average lifetimes of a decade. u-blox takes this customer expectation seriously to ensure not only that devices go the distance, but also that they evolve to optimize their performance and adapt to new standards and security requirements.

Nested design
With u-blox nested design, customers can mount alternate modules on the same PCB space as assembly options. This allows a single PCB design to adapt to new technologies or to regional requirements, which enables straightforward migration. This in turn protects the customers’ development investment and increases their flexibility.

Security
IoT security has finally landed on the radar of OEMs delivering IoT solutions to a wide range of verticals. You can’t have security without a rock-solid foundation to build on. That rock-solid foundation is what we refer to as the Root of Trust (RoT). Root of Trust offers a trusted set of advanced security functionality to guarantee that you are interacting with the right device and that your data remains secure. u-blox Internet of Things security features and services are designed for critical applications delivering confidential data. We integrate best-in-class hardware and software security to deliver holistic, ready-to-go security solutions greatly benefiting your Industry 4.0 deployments.

Our chipset, our technology
Modules based on our chipsets are not dependent on third parties and are focused on industry-specific feature development. This translates into long-term availability, roadmap stability, secure data transmission, and technical support down to the silicon level.

Quality
u-blox quality is led by the “Zero defect policy,” which we achieve by qualifying all our modules according to ISO-16750. In manufacturing, each module is individually tested, tuned, and x-rayed for optimal performance and full traceability. A stringent product change notification process with advanced notification further completes our quality procedure. u-blox also offers very short delivery time due to multiple well-stocked locations.

Global solutions
Developing successful solutions for global markets calls for a flexible hardware and software solution that you can rely on wherever your devices are deployed. Our Wi-Fi and Bluetooth modules are part of an extremely broad certification program and are certified for use across the globe. In cellular, as the global coverage map evolves from month to month, the possibility to adapt in real time will make it easier to transform your idea into a device that works in all four corners of the globe, all enabled by u-blox modules and technology.

<table>
<thead>
<tr>
<th>Threats</th>
<th>Principle</th>
<th>Benefits</th>
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| Modifications to the way that u-blox products and the customers’ applications work | Secure Boot | • Only genuine u-blox code is loaded at boot time  
• Only authenticated engineers can access debug facilities |
| | Secure Firmware Updates | • Authenticated firmware changes allow future security issues to be rectified  
• All firmware upgrades are from u-blox and are checked |
| | Secure interfaces and APIs | • Encrypted and hidden connections to other components such as control processors prevent hacking  
• Verification that commands from other components are valid and within the range of acceptable commands |
| Changing the data as it flows around the system | Secure Communications Transport Layer | • Secure communications to remote servers through signed and encrypted links over cellular or short-range radios |
| Taking control of u-blox products from unauthorised systems | Secure against spoofing and jamming; robust against software attack | • Detection of false input signals to positioning components  
• Protection against software attacks |
Facilitating integration while maintaining scalability

u-blox provides the technologies for tomorrow’s connected industry experience. We help in the design of systems through close integration of our portfolio, making it easier for device manufacturers to achieve superior performance.

### Short range radio modules

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANNA-B1</td>
<td>Smallest industrial Bluetooth 5 modules for size-constrained sensors</td>
</tr>
<tr>
<td>NINA-B3</td>
<td>Bluetooth 5 modules with long range for advanced sensor applications</td>
</tr>
<tr>
<td>NINA-B4</td>
<td>Bluetooth 5.1 modules for advanced sensor applications, extended temp range up to 105 °C</td>
</tr>
<tr>
<td>BMD-360</td>
<td>Bluetooth 5.1 module for sensors and beacons in location applications</td>
</tr>
<tr>
<td>BMD-345</td>
<td>Bluetooth 5 ultra-long range for advanced sensor applications</td>
</tr>
<tr>
<td>NINA-W15</td>
<td>Wi-Fi and Bluetooth multi-radio modules for micro-gateways; support MQTT, MQTT-SN, OPC-UA</td>
</tr>
<tr>
<td>JODY-W2</td>
<td>Wi-Fi 5 and Bluetooth 5 modules for device connectivity, HMIs, gateways, etc. Available with an extended temp range up to 105 °C. Uses NXP 88W8987</td>
</tr>
<tr>
<td>JODY-W3</td>
<td>Concurrent dual-band Wi-Fi 6 and Bluetooth 5.1 for gateways etc. Uses NXP 88W9098</td>
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</table>

### Cellular modules

<table>
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<th>Series</th>
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<tbody>
<tr>
<td>SARA-N3</td>
<td>Globally configurable NB-IoT modules ready for 3GPP Rel 14 and 5G</td>
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<tr>
<td>SARA-R4</td>
<td>Multi-band LTE-M / NB-IoT and EGPRS modules</td>
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<tr>
<td>SARA-R5</td>
<td>5G-ready multi-band LTE-M / NB-IoT modules with u-blox UBX-R5 chipset: to last an IoT lifetime</td>
</tr>
<tr>
<td>LARA-R2</td>
<td>Single or multi-mode LTE Cat 1 modules with positioning capability</td>
</tr>
<tr>
<td>TOBY-L2</td>
<td>Multi-mode LTE Cat 4 modules with HSPA+ and/or 2G fallback</td>
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[www.u-blox.com](http://www.u-blox.com)

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