Analyst day

November 20, 2019

u-blox Holding AG
The times are changing:
Who here has already taken a shared e-scooter? A shared bike? A shared car?
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>10:00 - 10:05</td>
<td>Welcome</td>
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<tr>
<td>10:05 - 10:25</td>
<td>The future will be wireless</td>
<td>Thomas Seiler</td>
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<tr>
<td>10:25 - 10:50</td>
<td>Technology insights</td>
<td>Andreas Thiel</td>
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<td>10:50 - 11:15</td>
<td>Q&amp;A</td>
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<td>11:15 - 11:30</td>
<td>Break</td>
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<td>11:30 - 11:55</td>
<td>Go-to-market strategy</td>
<td>Markus Schaefer</td>
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<td>11:55 - 12:00</td>
<td>Operations</td>
<td>Thomas Seiler</td>
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<td>12:00 - 12:10</td>
<td>Financial insights</td>
<td>Roland Jud</td>
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<td>12:10 - 12:30</td>
<td>Outlook &amp; Guidance</td>
<td>Thomas Seiler</td>
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<td>12:30 - 13:00</td>
<td>Q&amp;A</td>
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<td>13:00</td>
<td>Lunch</td>
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Disclaimer

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Harnessing change as driver for growth
Thomas Seiler
The future will be connected
Mobility and the cloud will drive demand for wireless technology
The future will be wireless

Wireless technology answers the three key questions: what, when, where
The future belongs to innovators

Hardware is becoming ever more complex, with u-blox spearheading innovation

- Over more than 20 years, u-blox has developed deep IP for
  - **Radios**: the sender and receiver of electromagnetic signals in the air
  - **Signal processors**: highly specialized processors that deal with huge data streams
- This IP is at the heart of our products and solutions.
- We embed this technology in highly miniaturized integrated circuits (chips).
- We solidify our success by continuing to invest in R&D and creating new products.
Innovation leader in wireless connectivity and positioning

Our line-up of wireless technologies makes us unique.

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<th>C</th>
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<tbody>
<tr>
<td>Cellular communication</td>
<td>Short range communication</td>
<td>Positioning</td>
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</table>

The combination of our three core technologies provides essential benefits to our customers:

- Complete solutions
- Full ownership of technology
- Maximum competence
- Solid product roadmaps
- Services on top of HW
- Improved functionality
- Secure connectivity
- Lifetime support

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* through Sapcorda, a joint venture with industry partners
We make wireless connectivity easy
Built bottom-up from core IP

- Modules simplify the integration of wireless technology – just connect power and antenna.
- Modules are certified and thoroughly tested during assembly.
- Our chips let specialized high-volume customers benefit from economies of scale.
- Our rich software suite makes it easy for customers to adapt products to diverse applications.
- Data services enhance the feature set and performance of our products.
We have a strong foothold in long-term markets
Industrials and automotive markets define our DNA

• We have strong traditional foothold in the industrial sector.
• We are experiencing continued growth in automotive.
• With our expansion into CEL and SHO, the consumer market has become an opportunistic application focus – mainly high-level consumer goods.
Growth drivers in the automotive space

In-vehicle electronic content is expanding strongly as volumes remain flat

- Internet connectivity replicated in the car
  - Wi-Fi hotspot
  - Smartphone to dashboard
  - Infotainment on all seats
- Vehicle to the cloud
  - Driver assistance
  - Car systems maintenance
  - Support services
- Vehicle-to-X (V2X)
  - Enhanced safety
- Position
  - Navigation
  - Automated driving

Source: auto motor und sport, Heft 24, 7 Nov 2019,
u-blox products connect vehicles
Wireless technology increases passenger comfort

Smartphone to dashboard
• Wi-Fi and Bluetooth

Rear seat entertainment
• Wi-Fi

Smart charging
• Wi-Fi

Keyless entry
• Bluetooth
u-blox products connect vehicles
Wireless technology enables driver assistance

Cellular connectivity
• LTE Cat 4+

In-car navigation
• GNSS

Car-to-car communication
• V2X

Automated driving
• GNSS
• Functional safety
Growth drivers in the industrial space

The scope of application is increasing rapidly as the wireless content in individual applications remains fixed

• Most industrial applications transfer small amounts of data.
• Efficient solutions are a must.
• Connectivity must support high capillarity and density of things.
• Local control loops are replaced by edge and cloud combined intelligence.
• Power-optimized devices deliver long battery lives.
u-blox products connect industrial goods
Wireless content makes stand-alone equipment a thing of the past

Power tools
• Bluetooth

Solar panels
• Cellular, Wi-Fi

Containers
• Cellular, Wi-Fi, Bluetooth
u-blox products are core to new industrial solutions

Wireless technology enables previously unimaginable automation solutions

- **Lawnmowers**
  - Cellular, GNSS

- **e-Scooters**
  - Cellular, GNSS, Bluetooth

- **Drones**
  - GNSS, Wi-Fi, Cellular
Why are we competitive?
We are innovative and reliable to the core.

- Since our foundation as a spin-off from ETH, we have maintained our innovative spirit, the still-present founders are the guarantors of this attitude.
- **Strong enthusiasm** for our purpose is the central driver in our product centers.
- We focus on our markets and customers with high dedication.
- We are lean and agile - we make innovative products with less resources and shorter turnaround times.
- Our large competitors focus on very large customers in the consumer space – not our realm.
- We have important markets shares in our market sectors and are often the undisputed leader.
- There is no comparable company with our unique strategic line-up.
Competition – main players
No other company offers the same solution space. Individual competitors only occupy a subset of our product sectors.

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<tr>
<td>Cellular communication</td>
<td>Short range communication</td>
<td>Positioning</td>
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<tr>
<td>Integrated circuits</td>
<td>Qualcomm Mediatek Sequans NXP Autotalks Silicon Labs Texas Instrument Qualcomm</td>
<td>Qualcomm STMicro</td>
</tr>
<tr>
<td>Modules</td>
<td>Laird Lantronix Alps LG Murata</td>
<td>Novatel Septentrio</td>
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<tr>
<td>Services</td>
<td>Trimble Hexagon</td>
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The market is more fragmented by many small local competitors.

The combination of our three core technologies offered in the form of chips and modules are unique in the market.

- Competitors in the space of integrated circuits focus mainly on the smart phone
- Competitors in the module space have no access to core IP and implement only the reference design of the chip suppliers
We have built this product space over many years
A steady journey from modules to chipsets to services

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<th>Integrated circuits</th>
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<table>
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<tr>
<th>Services</th>
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<tr>
<td>CellLocate® (modem based positioning)</td>
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<td>AssistNow™ (worldwide GNSS assistance service)</td>
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<td>GNSS Correction Data (for high precision)*</td>
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<td>FOTA (Firmware over the air)</td>
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<td>Lifetime security</td>
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*through Sapcorda, a joint venture with industry partners

- u-blox wireless and positioning technologies are available in a unique combination of chips and modules
- Combining technologies provides for solutions that deliver extra value not available otherwise
- This strategic core delivers our inimitable market placement and drives our profitability
Product launches 2019
Meeting our customers' needs for secure and simple cloud connectivity.

### Cellular communication

**SARA-R5**
The most advanced, secure, and highly integrated cellular modem offers unmatched end-to-end security and long product availability, making it ideal for IoT applications with long-term device deployments.

### Short range radio communication

**NINA-B4**
Our Bluetooth low energy module series of stand-alone modules is ideal for indoor positioning applications and for deployments in harsh environments.

### Positioning

**ZED-F9K**
High precision accuracy and low latency target automotive OEMs and Tier 1s developing V2X applications.

**M9**
The ultra-robust M9 technology platform will serve demanding automotive and high-end telematics applications.

### Services

**u-connectScript**
Enables easy and interactive development of embedded applications, simplifying wireless Bluetooth and Wi-Fi device development.
e-scooter market size
Micromobility is only just getting started.

Berg Insight 2018
e-scooters – in summary
A next application space for wireless technology.

• Only feasible with **highly sophisticated wireless technology**
• **Our new products** form the ideal solution package
• Requires all our technologies in **module format**
• Enhanced functionality via our **services** essential to solution robustness
• Require **more of our technology** as vehicles become autonomous
Technology insights
Andreas Thiel
What it takes
Our technologies
The wireless connectivity solutions for IIoT

IIoT = Industrial Internet of Things
Solutions from combinations of our technologies

We provide the core for many IoT applications

- Cellular connectivity enables **wide-area connectivity** to the cloud
- Short range complements connectivity for **high capillarity**
- Positioning reliably **locates the asset**
- Our solution package delivers **outstanding functionality** thanks to high coherence between the three technologies
- Services **add value** to core functionality
- Our solution package represents up to **70% of the bill of material** of a finished product

Our solution space: three core technologies + value-added services
u-blox proprietary wireless technology is unique

- **Long-term attitude**: Wireless chips and modules in the industrial and automotive markets have a 5-10 year lifecycle.
- **Mixed signal competence**: Analog radio and digital signal processing on one piece of silicon are our core technology and difficult to replicate.
- **High software content**: The specific software can only be developed by experts. It makes up 70% of our R&D cost.
- **Core intellectual property (IP) re-used**: Between generations of products and across the product portfolio. Low risk of obsolescence.
- **Value-added services based on our core IP in the end device**: Services enhance customer experience over the product lifetime.

- 15 R&D centers worldwide
- 700+ engineers
- CHF 100m+ annual investment (2018)
Many elements define the final solution
Our customers rely on a broad range of our capabilities

**Broad product portfolio**
- Modules - a tested and certified assembly
- Form factor policy
- Multiple technologies combined
- Offering solution packages

**u-connect software**
- Saves development time & investment
- Accelerates time to market
- Easy integration
- Pre-flashed at delivery
- Secure boot to protect your system

**Development support**
- Structured product lifecycle process
- Module revision process
- Documentation under strict revision control

**Certification**
- Extensive global regulatory certifications
- Standards qualification and listing
- Health and safety
- Recertification to new or updated standards and mandates

**Quality and reliability**
- ISO 9001 certified processes
- Product qualification based on standards
- Lifetime reliability predictions
- Controlled product changes
- Zero defect policy
- Automotive industry compliant

**Manufacturing**
- Reliable production and logistics
- Capacity for high delivery flexibility
- 100% testing, tuning, and inspection
- Manufacturing sites automotive certified
- Long- and short-term planning loops
- Safety stock concept

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Cellular offering
Cellular technologies are evolving towards 5G

From legacy to LTE*-based standards releases

- **Enhanced mobile broadband**
  - High bandwidth
  - High cost
  - High mobility

- **Ultra-reliable low latency communication**
  - Ultra-low latency
  - Highly reliable
  - Highly secure

- **Massive machine-type communication**
  - High device density
  - Low bandwidth
  - Low cost
  - Low power

- **Digital voice**
  - Voice + data
  - Data only

- **GSM**

- **UMTS**

- **Multi-mode**

- **2G**

- **3G**

- **4G**

- **5G**

- **Evolution to high speed cellular**

- **Evolution to cellular LPWA**

- **Legacy standards**

- **LTE standards** (LTE=Long term evolution)

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What CEL technologies deliver

From legacy 2G to 5G

2G / 3G
• Low to medium data rates
• Legacy network support, including data and voice

LTE-M / NB-IoT
• Ultra-low to medium data rates ideal for IoT
• Broad coverage
• Ultra-low power

LTE Cat 1
• Medium data rates
• Mobile applications
• Video / audio streaming

High Cat LTE
• Highest data rates
• Video transmission and infotainment
Short range offering
Short range radio capabilities are expanding
More possibilities with Bluetooth and Wi-Fi

- **High throughput**: High bandwidth, High frequencies
- **Low power**: Low bandwidth
- **General purpose**: Various bandwidths, Timing, Positioning
- **V2X**: Dual band, High reliability
- **Mesh**: Various bandwidths, Redundancy
- **Long range**: Extended range, High robustness

What SHO technology delivers

u-blox has the widest range of solutions

Sensor connection
- Capillary connectivity
- Ranging for positioning

Gateways, access points
- Bluetooth connectivity combined with Wi-Fi for internet access

V2X
- Reliable data transmission for enhanced vehicle safety

Networks
- Meshing of devices
- Long-range connectivity for controls
Positioning offering
The GNSS technology evolution
We are ahead the curve driving innovation

From minutes to 26s
From -130dBm (outdoor) to -167dBm (indoor)
From GPS to GLONASS, QZSS, BeiDou and Galileo (multi constellation)
From meter- to centimeter-level accuracy
From reliable to trustworthy systems

TTFF
Sensitivity
Multi GNSS
Accuracy
Integrity & safety
What POS technology delivers
u-blox is the benchmark for GNSS positioning performance

**Standard precision**
- Meter-level accuracy suitable for a wide range of applications

**High precision**
- Decimeter- to centimeter-level accuracy for robotics and autonomous driving

**Dead reckoning**
- 100% positioning information also in parking garages or tunnels

**Timing**
- Highly accurate timing used in communication networks, power grids, or financial systems
Security is essential for building trust into IoT applications.
Areas of security

Confidentiality
• System assets can be only used by authorized parties (secrecy)

Availability
• Assets are accessible to authorized parties in a timely manner

Integrity
• The systems offers a measure of the trust in the correctness of the information provided

Robustness
• Systems are impervious against intentional or unintentional interference
## Benefits of u-blox principles

<table>
<thead>
<tr>
<th>Threat</th>
<th>Principle</th>
<th>Benefits</th>
</tr>
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<tbody>
<tr>
<td>Modifications to the way that u-blox and customers’ products work</td>
<td>Secure boot</td>
<td>Only authenticated engineers can access debug facilities</td>
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<tr>
<td></td>
<td>Secure firmware updates</td>
<td>Any firmware upgrades are from u-blox and are checked</td>
</tr>
<tr>
<td></td>
<td>Secure interfaces and APIs</td>
<td>Encrypted and hidden connections to other components such as control processors avoids hacking</td>
</tr>
<tr>
<td>Changing the data as it flows around the system</td>
<td>Secure communications transport layer</td>
<td>Secure communications to remote servers through signed and encrypted links over cellular or short-range radios</td>
</tr>
<tr>
<td>Taking control of u-blox products from unauthorised systems</td>
<td>Secure against spoofing and jamming; robust against software attack</td>
<td>Detecting false input signals to positioning components</td>
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Customer wins
## Use case: addMobile

Versatile professional tracker

<table>
<thead>
<tr>
<th>Solution</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Combines all <strong>three key technologies</strong> for the solution</td>
<td>• <strong>Higher efficiency</strong> on site</td>
</tr>
<tr>
<td>• <strong>Cost-efficient</strong> offering</td>
<td>• Logs work orders and fleet usage, enhances security, and locates tools</td>
</tr>
<tr>
<td>• <strong>Vast installed base</strong> of interoperable BLE technology</td>
<td>• <strong>Robustness</strong> with combined wireless technologies</td>
</tr>
<tr>
<td>• POS, CEL, SHO</td>
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# Use case: Leikr

## Wearable hub for eHealth

<table>
<thead>
<tr>
<th>Solution</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Collects and transmits patient data</td>
<td>• Delivers <strong>reliable connectivity</strong> (enhanced with key indoor positioning features)</td>
</tr>
<tr>
<td>• Smart medical watch that acts as a wireless gateway, channeling data from other medical devices to the cloud</td>
<td>• <strong>Simple</strong> to configure with u-connect</td>
</tr>
<tr>
<td>• POS, CEL, SHO</td>
<td>• <strong>Secure</strong> with hardware-based root of trust</td>
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## Use case: Cowboy

**Smart e-Bike**

<table>
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<tr>
<th>Solution</th>
<th>Benefits</th>
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</table>
| Cowboy E-bike 2.0 | • **Strong** cellular connectivity  
• **Reliable** positioning of the bike for preventing theft  
• **Easy** to configure via smartphone app |

• Next generation smart e-bike allowing various business models and extra services  
• POS, CEL, SHO

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## Use case: Husqvarna

### Autonomous lawnmower

**Solution**
- Autonomous lawnmower platform
- CEL, POS

**Benefits**
- **CEL connectivity** and **high precision positioning** make this device an autonomous vehicle
- “u-blox is known for their experience with GPS and **their competence** in that area” (Husqvarna CTO)
Use case: High Great

Drone light shows

<table>
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<tr>
<th>Solution</th>
<th>Benefits</th>
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<tr>
<td>• Drones for light shows replacing fireworks</td>
<td>• <strong>High precision positioning</strong> makes high-resolution harmonic graphs possible</td>
</tr>
<tr>
<td>• POS</td>
<td>• “Without the high precision technology from u-blox this would not have been possible!” (High Great CTO)</td>
</tr>
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</table>
Why do we invest into silicon and core software?
Achieving sustainable competitive advantage and value creation

- We **derive a larger part of the value chain** by delivering more:
  - Enhanced functionality
  - Lower cost of ownership
  - Added services
- We gain **independence** from 3rd party chipset roadmaps: Better fit to customer demand.
- We **increase margins** over the lifetime of the product.
- Customers take **long-term commitment** with u-blox because of our ownership of core intellectual property (IP).
- **Better customer support** thanks to full insight and control.
How do we do this?
R&D is a long term investment, developing products for tomorrow

Products launched

- **C** 2G & 3G cellular modules
- **P** SPG chips & modules
- **S** Host-based & stand-alone modules
- 4G chips & modules
- HPG, DR & timing chips & modules
- BT 5.1, V2X
- 5G cellular chips & modules
- Functional safe next generation chips & modules
- Capability enriched chips & modules

Strategic steps in product development

- Module
- Core IP
- Chip
- Data services
The best is yet to come
Wireless technology shapes products and use cases

Autonomous driving is around the corner

- Connectivity to the cloud combined with edge computing allows solving very complex problems of autonomous control
- High precision and functional safety are key to such solutions
- u-blox has invested into this space for many years and will continue to expand its leadership

Die neue S-Klasse 2020
Source: Auto motor und sport Heft 24, 2019
Autonomous vehicle for micromobility
Wireless technology at work for the mass market

• Geofencing to avoid running scooters in pedestrian areas
• Scooters can return themselves to charging stations without a driver

China's Ninebot unveils scooters that drive themselves to charging stations
Reuters Aug 16 2019
Go-to-market strategy
Markus Schaefer
Expanding our value proposition
We are entering phase 3

• Phase 1: 1997...2008
  • Achieved technology leadership in POS – IP and chipset
  • u-blox established as the prime brand for positioning especially in automotive and industrial markets

• Phase 2: 2008...2018
  • Complemented portfolio with connectivity products for CEL and SHO
  • Gained full IP incorporated in chipsets

• Phase 3: 2019...
  • Reach leadership position in automotive and industrial segments with strong growing and market-shaping customers
  • Broaden solution offering with unique value to the customer, based on a deep understanding of customer requirements...
  • ...creating more value and expanding our reach
Select the right target markets

**Automotive**
**Typical applications**
- Vehicle telematics
- Emergency call systems
- Insurance boxes
- Autonomous vehicles

**Industrial**
**Typical applications**
- Asset tracking
- Automation
- Precision timing
- Smart metering
- Point-of-sales terminals
- Gas and water metering
- Smart traffic
- Security surveillance

**Consumer**
**Typical applications**
- Wearables
- Drones
- People and animal tracking
- Car accessories
- Mobile hotspots and routers
u-blox’s unique selling proposition

- **Positioning** is a necessary anchor for determining the source of information.
- **Wireless connectivity** is the essential functionality for transferring data to the cloud.
- The combinations form the **solution space** – with unmatched functionality.
- We are **undisputed leaders** in positioning with strong brand recognition in our target markets, offering an anchor to sell bundled solutions.
u-blox owns 70% of Bill of Material
Establishing leadership with selected customers

- u-blox offers **added value functionality** because we own our IP.
- u-blox has a big advantage compared to others by **offering the complete connectivity solution**.
- u-blox often occupies 50-70% of the bill of material.
- **Highly capable support** is key to engaging the customer.
The u-blox value pyramid
A profound value build-up

- Unique **problem-solving capabilities** based on core IP for our solutions
- Unique **module and system-in-package** capabilities
- **Product road map** aligned with customer application problem
- Strong technology, product, and application know-how allow a **high-touch customer experience**
The key steps to customer engagement
A realized solution sets the basis for the future business potential

- A customer engagement involves moving the customer through several phases.
- Strong presence and technical **competencies** required in evaluation and design-in phases.
- The **solution creates the value** for the customer and is validated with the design-in.
- The design-in **locks in the customer.**
The u-blox support pyramid
Build best-in-class customer experience

- u-blox offers a high-touch customer experience with competencies directly deployed at the customer interface.
- Application marketing and product experts are part of our sales force.
- Strong technology, product, and application know-how allow strong solution capability.
- Product roadmaps and development are closely aligned with customer problem space.
Channels, global channels, and local expertise

Strong global customer reach

- Direct sales force
- Local specialized distributors
- Catalogue and global distributors
- World-class technical support
- Maker community foothold
6700 customers worldwide
Continued expansion of our customer base
Razor-sharp focus to move design-ins to business-wins

Structures for supporting a large customer base

• We manage a large customer portfolio:
  • The right structure in place with well thought-through concept based on **direct sales**
  • With **100 «A» customers we make 80% revenue** and they get highest level of attention.
  • With the remaining 6000 customers we offer support via distributors, forum, portal, documentation, tools for **optimum customer satisfaction**.
  • **Deep engagement with customers** by our technical and sales resources, and channel partners.
  • We are a **long-term partner** aligned with our customers product lifetimes.
Tier marketing
Value chains spread over several tiers, and globally

- Pull and push marketing
- OEMs increasingly determine specifications and technology selection
- Tier 1s maintain platforms for bidding at OEMs
- Global bidding needs a unified sales channel that can follow up on all tiers involved
Visibility – we know our customer base inside out

High fulfillment rate of customer needs and high rates of business wins

- We **know all our customers** and all their projects.
- We have a complete database (CRM) of customers.
- **Fast reaction** to customer demand – short delivery lead times.
- **Business is anchored on design-ins, not contracts.**
- We engage in **strategic relationships with global players.**
We extract more value through our value proposition

Strong cross-selling potential

• Positioning is a necessary anchor for determining the source of information. We drive innovation and are **thought leaders** in standard and high precision navigation.

• Wireless connectivity is the **essential functionality** for transferring data to the cloud with an increased sensitivity for secure data connection.

• u-blox helps customers improve **time-to-business** and adds value beyond a typical component supplier by delivering the complete solution.
Undisputed foundation in the value chain

Looking forward

• Our position builds-up from core and cannot easily be attacked.
• We deliver complex technology to our OEM customers that otherwise is difficult for them to get.
• u-blox offers a high-touch customer experience with service capabilities and competencies that are unique in the industry.
• We do not compete with our customers.
Operations
Thomas Seiler
Leading production partner
We work with the world leaders – for more than a decade

#1
GLOBALFOUNDRIES #2

flex #3

Amkor Technology #2

# = global classification per segment
Not affected by trade tensions

Our manufacturing and warehouse locations are outside the regions in conflict
Financial insights
Roland Jud
R&D capitalization model

- Half year R&D planning cycles
- Strong program management handling 250+ concurrent R&D projects
- This model is the basis for R&D cost capitalization
  - Gate 2: technical feasibility, Intention to complete, Ability to sell, positive future cash flows \(\rightarrow\) start capitalization
  - Gate 7: product available for sale \(\rightarrow\) start amortization
Our development cycle

Large up-front investment – very long harvesting time

- Start development
- Initial production
- Mass production
- End of life
What the balance sheet reflects
A rich technology socket comprised of highly valuable IP

- All technologies reflected in capitalized R&D – **our core value**
- We capitalize R&D costs between **start of development** and **initial production** (capitalization rate H1. 2019 = 42%)
- New technology platforms require investments between CHF 20m and 35m.
- Currently we are capitalizing **six new platforms** spread over all technologies, the **core value of u-blox**
- Cellular technology takes a higher share because this technology delivers the products with the highest ASP.

![Surface represents approximate share in capitalized R&D cost](image)

CHF 195m (30 June 2019)
Free cash flow  
R&D intensity managed for positive free cash flow

- **Free cash flow is our key KPI**  
  Free cash flow impacted by working capital (inventories are temporarily high to cope with shortages on certain components)

- **R&D intensity managed** to achieve positive free cash flow

- From 2015-2019 intense R&D periods for establishing **several new chipsets** – now turning to harvesting and positive free cash flow

**Input to modeling R&D cost:**
- Estimate R&D cash expense for positive free cash flow
- Reflection in income statement:
  - 45% capitalization rate
  - Amortization period 3 - 5 years
Strategy – 4 pillars

Market position

- Strong leader in automotive and industrial markets, 60% market share in automotive
- High quality and reliability

Technology and innovation

- Chipset offer broadly expanded
  - POS: 9th generation incl. high precision
  - CEL: R3 and R5 for Cat 1, M and NB
  - SHO: V2X

Operational excellence

- Lean and agile organization
  - 2010: 400 engineers, 1 program
  - 2019: 800 engineers, various programs
- Strong expansion of number of customers

Strategic partnerships

- Many partnerships: Kudelski, Sapcorda
- Acquisition of Rigado - 15 acquisitions so far
Strategic acquisitions and partnerships
Accelerating the expansion of competence and product offering

**Rigado**
*Acquisition*
- Bolt on of SHO business
- Increase market share
- Extend our offering for short range modules
- Reach out to industrial and consumer market
- More cross-selling opportunity

**Sapcorda**
*Joint venture*
- Building the database for worldwide availability of correction data
- The necessary service for high precision positioning
- Opportunity for recurring revenues

**Kudelski**
*Partnership*
- Expanded partnership in 2019
- Help clients protect IoT devices and the ecosystems that they enable
- Offering IoT security in HW and as SW
- Partnering for consulting services for our customers
Having delivered on promises
Products launched, strategic position enhanced

- Recent product launches deliver as expected
  - Excellent customer feedback
  - Ramp-up as expected
- New platforms **fork into new application areas**, beyond pure technology succession
  - Example POS: M9, F9
- **Chip migration** potential built with previous generation of modules

![Graph showing product ramp-up for Cat M modules]
Guidance
Thomas Seiler
Guidance 2019

• **Outlook 2019**
  - Structural growth compensates for cyclical decline
  - APAC good growth thanks to solid demand in China in the industrial field
  - EMEA flat outlook due to overall negative sentiment in the industry and the decline in automotive production
  - Americas Cat M demand ramping up but industry hampered by adaptations of the supply chain to avoid import duties
  - R&D amortizations increasing over 2018 with new products entering production phase and lower R&D capitalization rate

<table>
<thead>
<tr>
<th>Actual FY 2018 (IFRS)</th>
<th>Updated guidance Aug 2019 (IFRS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>393.3m</td>
</tr>
<tr>
<td>EBITDA</td>
<td>71.6m</td>
</tr>
<tr>
<td>EBIT</td>
<td>48.3m</td>
</tr>
<tr>
<td>CHF</td>
<td>CHF</td>
</tr>
</tbody>
</table>

Exchange rate assumptions for 2019:
- EUR/CHF: 1.12
- USD/CHF: 0.99
- GBP/CHF: 1.27

**FX-sensitivity against CHF:**

<table>
<thead>
<tr>
<th>+10% of</th>
<th>USD</th>
<th>EUR</th>
<th>GBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>+ 9%</td>
<td>+ 1%</td>
<td>0%</td>
</tr>
<tr>
<td>EBITDA</td>
<td>+ 16%</td>
<td>0%</td>
<td>-1%</td>
</tr>
<tr>
<td>EBIT</td>
<td>+ 22%</td>
<td>- 1%</td>
<td>- 2%</td>
</tr>
</tbody>
</table>
Solid basis for business expansion
Our many product initiatives pave the way into expanding markets

• We **participate in market expansion** driven by increasing mobility and expansion of cloud services.
• Our **product initiatives** preempt important megatrends in the industry – we have invested in new platforms in all our technologies.
• We are preferred by the **leading customers** for our technology IP and innovation leadership.
• Our technology core assures the basis for **resilient value-added services**.
• Our product diversification by customers, applications, and geography **assures stability in growth**.
• Economies of scale **strengthen profitability**.
Positive impact on financial position
Continued long-term investments pay off

• With our several new platforms we have created important pillars of IP that allow to sell at a premium price.
• Next generation products will profit from increased R&D efficiency due to re-use of IP blocks.
• All of our six new platforms allow the creation of services that we can monetize.
• Cross-selling effects are further strengthened.
• Our business volume delivers sizable economies of scale.

• Side note: Swiss income tax reform will reduce tax rate from FY 2020
**Long term outlook – 4 year horizon**

Substantial growth ahead – new product platforms come to play

<table>
<thead>
<tr>
<th>Revenue M CHF</th>
<th>Free Cash Flow %</th>
<th>EBIT %</th>
<th>EBITDA %</th>
</tr>
</thead>
<tbody>
<tr>
<td>700</td>
<td>7%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>800</td>
<td>10%</td>
<td>13%</td>
<td>25%</td>
</tr>
</tbody>
</table>

*Adverse macroeconomic conditions and continued trade war tensions may shift this time horizon*
Takeaway: Unique market position

Grounds for mid-term optimism

Wireless connectivity – a centerpiece technology
- LPWA cellular networks driving new high-volume use cases (e.g. e-scooters)
- Demand for solutions combining multiple technologies on the rise
- Automotive and Industry expanded by immutable growth drivers

In-house IP for improved customer value
- Capitalizing on R&D efforts for strong customer loyalty
- Increased ownership of IP deliver independence from third parties for matching true customer needs
- We vastly simplify product development for our customers

There is no comparable company with our unique strategic line-up
Thank you for your attention