# TestForum 2013

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# Test Station
# Hardware design that lasts for ever

# Not the design period that lasts for ever

## The KITRON Utopia

November 2013

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# Delivery of the Entire Value Chain

| Development | Industrialisation | Sourcing & procurement | Manufacturing | Logistics & Distribution | Redesign Repair Maintenance |

**KITRON industrialises and manufactures electronic products for the professional corporate market**

| Telecoms | Defence/ Aerospace | Offshore/ Marine | Medical equipment | Energy | Industry |

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We can stay a lead supplier in an industry under pressure due to quality and accuracy.

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# Our Dream Customers

- **Know what they want**
- **Know what is possible to do**
- **Have tons of money for development**
- **Realize that things take time**


- **Answer their e-mail on regular basis, not only when they are running out of time.**

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# Our Dream Customers



Sheik Ben Redic Fy Fasan



Tony Stark (Iron Man)

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# Longevity of Items

| Item | Lifetime | Warranty | EOL? |
| --- | --- | --- | --- |
| Power supply | 10y | 1-3 y | 5 y |
| Cables/Connectors | 500 matings | - | ? |
| PC | 5 y | 1y | 0,5y |
| DMM | >10 y | 1-3 y | >5 y |
| Oscilloscope | >20 y | 1-3 y | >5 y |

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# Longevity of items - Warranty

- **Sub-suppliers**
  - 1 – 3 years warranty

- **Delivery time standard test system**
  - 6 – 12 months (sometimes more)

- **Customers**
  - 20 years of support

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# Challenge

1.      **Equipment can be out of warranty before delivery time**

2.      **Equipment can have EOL before our warranty to the customer is out**

3.      **Trading regulations EU/EEA**

# Challenge

- **Economy**

- **Sub suppliers**

- **Customers**

- **Us**

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# Goal: Making HW that lasts forever

- **Repairs itself**

- **Saves the day**

- **Always on the good side**

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# How to make the TS last forever?

- Have spares!
- **Spare pairs on cables, spare relays, spare DI/DO, AI/AO.**


- Accessibility
- **Possible to replace one item (cable, connector, instrument, relay) without disassembling the entire TS.**

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# How to make the TS last forever?

- **Choose INTERFACES that will last.**

- **TAG/LABEL all the contents of the TS as if it is to be replaced in the future.**

- **Make the system USER FRIENDLY (stupid simple) to avoid unnecessary wear.**

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# Choice of Interfaces

- **Standard interfaces**
- **Ethernet**
- **USB**
- **Wireless?**

- **More stable Interfaces**
- **PXI**
- **RS 232**

## Availability or Stability ?

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# Tagging / Labeling

- **Tag interchangeables (cables instruments PBAs) to make maintenance a positive thing for the Tech.**

- **Easier to use spares if they are labeled as such**

- **Calibrated/SW-tuned instruments should be well marked. Critical to replace correctly, recalibrate if replace.**

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# User Friendliness

- **Wear parts.**
  - **Connectors, cables, probes**
  - **Easy to replace to avoid unnecessary wear**
  - **Shelf supplies not custom made**

- **Simplicity**
- **Stupid simple**
- **If the user is in doubt, they will at some point press the wrong button.**

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# User Friendliness

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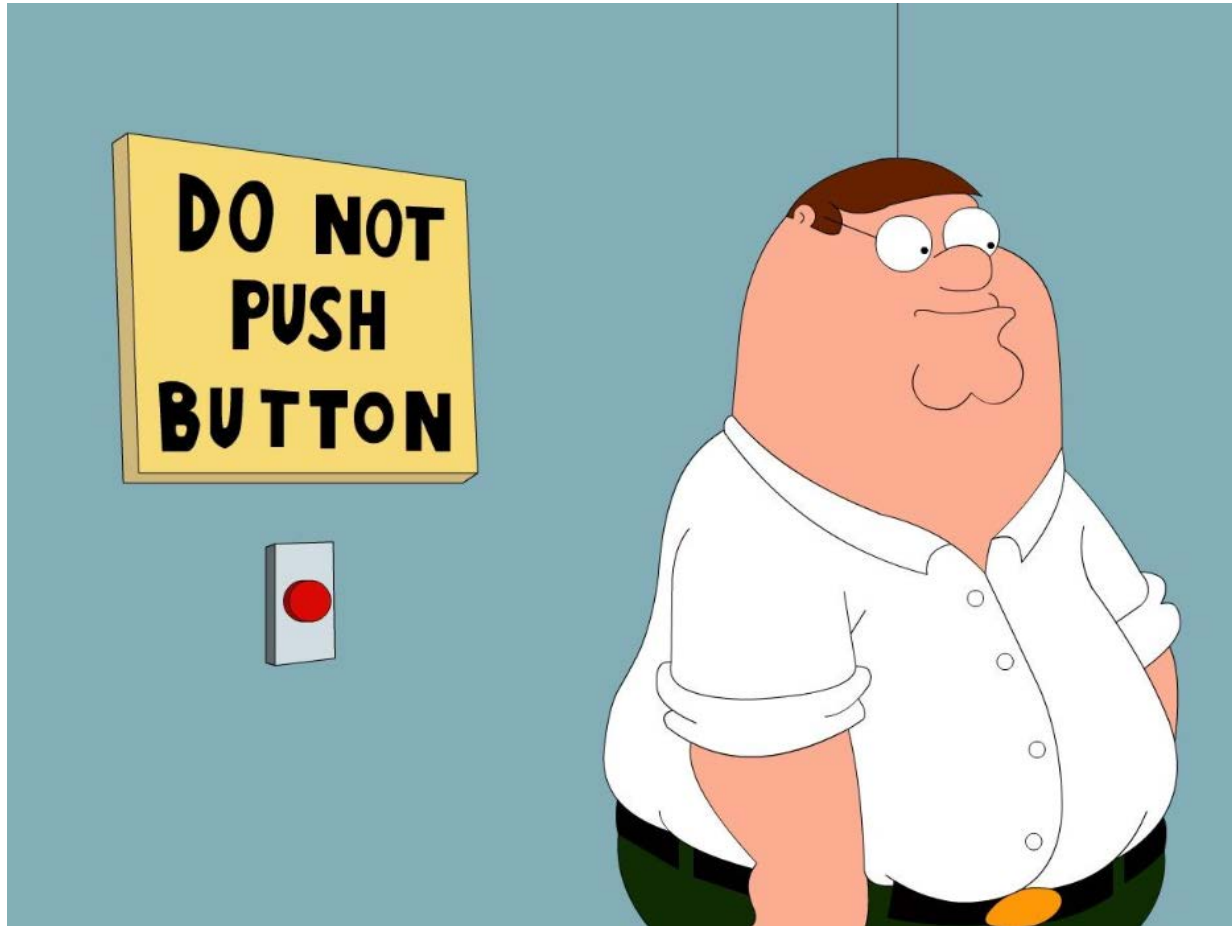
# Conclusion

- **Make things replaceable**

- **Make things accessible**

- **Less is not more (Have spares)**

- **You can never tag to much.**

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# THANK YOU

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# Kitron Group

- Operations in Norway, Lithuania, Sweden, Germany, China and USA

- Manufacturing of high complexity products for global markets

- About 1200 employees

- Revenue 2012: about NOK 1.7 billion

- Listed on Oslo Stock Exchange

- Main shareholders:
    - Sievi Capital Plc.  (FI ~ 33%)
    - Kongsberg Group (NO ~ 19%)
    - Amber Trust II (Int'l ~ 17%)

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# Kitron group



Europe

Arendal facility

Karlskoga office

Jonköping facility

Kaunas facilities (2)

Stuttgart facility

China

Ningbo facility

USA

Johnstown facility

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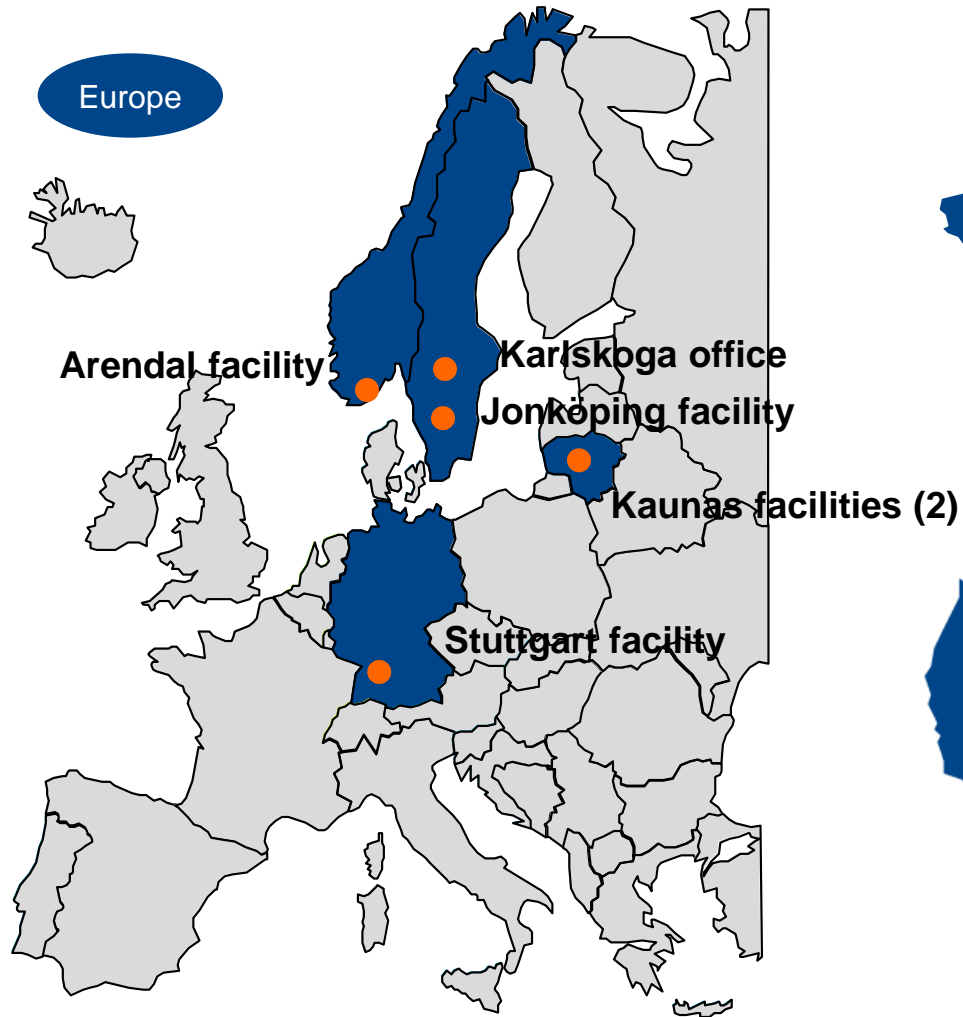
# History

| Year | Significant Events |
|------|--------------------|
| 1962 | Established in Norway |
| 1989/90 | Integration of Alcatel/Ericsson in Norway |
| 1997 | Listed on the Oslo Stock Exchange |
| 1997/ 1998 | Integration of Siemens, Nera, Tandberg Data, Kongsberg Electronics |
| 1999/ 2000 | Kitron acquired 2 sites in Sweden, from Bofors and Saab |
| 2001 | Acquisition of manufacturing site in Lithuania |
| 2007 | Sourcing organisation in Ningbo, China |
| 2009 | Acquisition of company in Germany |
| 2010 | Kitron Manufacturing, Ningbo, China Kitron Inc., Johnstown, USA |

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# Strategy and Capabilities

- Product focus
    - High complexity
    - Professional applications

- Knowledge-based company

- Well established supply chain

- High local manufacturing competence in each country combined with low cost manufacturing

- Product transfer competence

- Project management expertise

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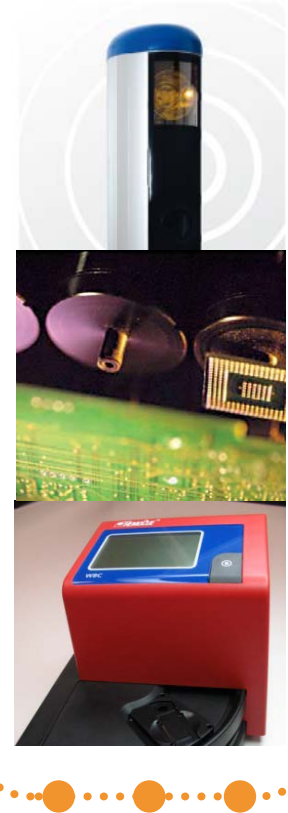
# Human resources

- Kitron's most important competitive edge is the competence of our employees.

- It is part of our strategy to maintain and develop a high level of competence through professional and active develop-ment programs and recruitments.

- Our corporate HR programs and activities are supporting this ambition and are based on our common values and business strategy.

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# Competence Development
## - Better service performance towards customers

- Training at local and group level that includes:
  - class room programs
  - on the job training
  - project work
  - cross border team work.
- <u>2012:</u> 28 000 hours spent on training
  - 23 h training per employee
  - 19 000 h on Manufacturing/Technical
  - 1 600 h on Leadership
- <u>2011:</u> 24 500 hours spent on training
  - 20 h training per employee
  - 14 800 h on Manufacturing/Technical
  - 2 300 h on Leadership

Best in class companies
are at 35-40 h/employee

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# Innovation and Development

- Kitron has a network of competent Development partners which cover the total competence need of the market.

- This model gives Kitron the flexibility to select right partner for customer needs.

- The market leading Development company Prevas AB is our main partner

- We provide everything from idea to finished product and after sales services.

- We think product life-cycle from the start.

- We are the ultimate one-stop shop for outsourced product development and manufacturing services

- We design and manufacture high complexity products for global markets

| Innovation | Development | Industrialisation | Sourcing | Manufacturing | Logistics | Redesign & After sales services |

**Prevas**
*Innovation for Growth*

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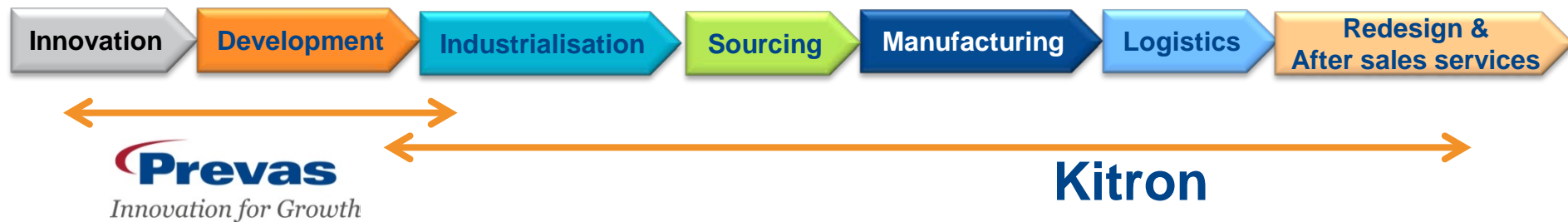
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# Industrialisation

- Kitron NPI (New Product Introduction) Center specialises in product industrialisation and prototype assembly

- Prototypes are produced by highly qualified staff on dedicated manufacturing lines. We also have model-building workshops capable of constructing complete prototypes.

- Our business concept is to contribute to create value to our customers by:
    - Shorten Product "Time to Market"
    - Reduce life-time cost of the product
    - Simplify communication

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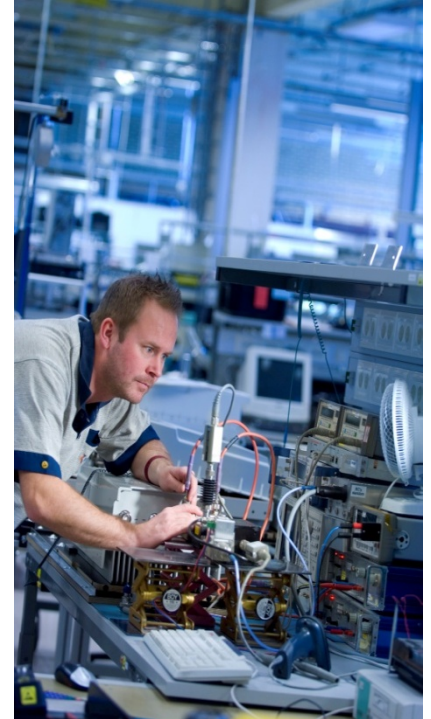
# Sourcing

- **Global sourcing**
  - We continuously monitor and take advantage of the opportunities that the global supplier market offers

- **Cost reduction programs**
  - Cost improvements will secure our customers supply chain and competitiveness

- **Preferred vendor list**
  - Focus on consolidation and benefit in matters of cost, quality and attention from the key suppliers

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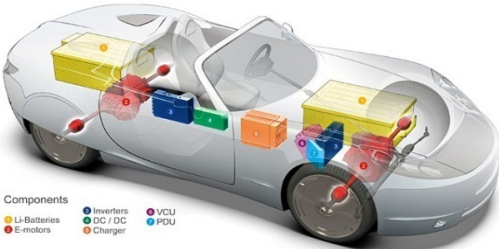
# Segments and Customers

| Segment | Key products | Application | Selected customers |
|---------|--------------|-------------|--------------------|
| Defence | ▪ Defence Avionics<br><br>▪ Defence Communication<br><br>▪ Weapon Control Systems & Ammunition | | BAE SYSTEMS<br><br>THALES<br><br>KONGSBERG<br><br>LOCKHEED MARTIN<br>We never forget who we're working for™<br><br>SAAB<br><br>Aimpoint<br><br>BOFORS DEFENCE |

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# Segments and Customers

| Segment | Key products | Application | Selected customers |
|---------|-------------|-------------|-------------------|
| Energy | ▪ Protection and Control Systems for HV Transmission<br><br>▪ High Voltage Rectifier Control units<br><br>▪ High Voltage Circuit Breaker Control units<br><br>▪ Smart Grid/ Automatic Meter Reading systems<br><br>▪ Power system relays for energy transmission and distribution |  | ABB<br><br>TR:TECH<br>We turn technology into business.<br><br>CONNODE<br><br>Aidon<br><br>embriq<br><br>BRUSA energy-efficient |

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# Segments and Customers

| Segment | Key products | Application | Selected customers |
|---------|--------------|-------------|--------------------|
| Telecoms | <ul><li>Access Telecoms</li><li>Detect and Positioning systems</li><li>Video conference system</li><li>Speed camera systems</li><li>Automatic toll road systems</li><li>Industrial intercom solutions</li><li>Interactive hotel TV systems</li></ul> |  | CellMax<br>transmode<br>kapsch >>><br>OTRUM<br>net insight<br>sensys |

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# Segments and Customers

| Segment | Key products | Application | Selected customers |
|---------|--------------|-------------|--------------------|
| Industry | <ul><li>Vehicle Control Systems</li><li>Electronic Control Units (ECU)</li><li>Recycling and vending systems</li><li>Central process Units</li><li>RED dot sight</li><li>Feeder system for SMT machines</li><li>Control Units for Robots</li></ul> |  | ABB, VOLVO, Atlas Copco, ABAX, BOMBARDIER, PLASTON, HSM, TOMRA Helping the world recycle, KOLLMORGEN, Husqvarna, MICRONIC MYDATA, SAAB TRANSPONDERTECH, Badger Meter Europa, EMERSON Process Management |

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# Segments and Customers

| Segment | Key products | Application | Selected customers |
|---------|-------------|-------------|-------------------|
| Medical equipment | <ul><li>Ultrasound and Cardiology System</li><li>Respiratory Ventilators</li><li>Laboratory, IVD</li><li>Operation panel for radiology systems</li><li>Blood centrifuge system</li><li>Digital mammography</li><li>LED lamp for photodynamic therapy</li><li>Point of care testing and analysis</li></ul> |  | GE Healthcare, CELLAVISION, ELEKTA, MAQUET GETINGE GROUP, Laerdal, SECTRA, DiaSorin, Thermo SCIENTIFIC, HemoCue |

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# Segments and Customers

| Segment | Key products | Application | Selected customers |
|---------|-------------|-------------|--------------------|
| Offshore/ Marine | ▪ Subsea control systems<br><br>▪ Seismic sensors and equipment<br><br>▪ Wireless sensors<br><br>▪ Surveillance systems |  |  |

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# Kitron manufacturing setup

**- Proximity to customers and low cost production in Lithuania and China**

- Modern facilities in Norway, Sweden, Lithuania, Germany, China and USA
- More than 40 000 m$^2$
- Cutting edge expertise in the areas of:
  - Printed circuit board assembly
  - Electronics
  - Radio frequency
  - Microelectronics
  - Test (incl. system test)
  - System integration
  - Assembly (incl. high level assembly)
  - Upgrades and repair
  - Maintenance

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# Manufacturing facilities

## Arendal

**Country:** Norway
**Manufacturing area**: 18 000 m$^2$
**FTE:** 478 (per August 2013)

**Segment focus:**

- Medical equipment
- Defence/Aerospace
- Offshore/Marine
- Energy
- Telecoms
- Industry

*Scandinavia's largest and most modern EMS plant*



Norway

**Key competencies:**

- Electronics and backplane assembly
- Box-build products, High Level Assembly
- Systems integration, NPI centre
- Test development
- Functional test systems
- Wireless technology (RF)

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# Manufacturing facilities

## Jönköping

**Country:** Sweden
**Manufacturing area**: 5 500 m$^2$
**FTE:** 141 (per August 2013)

**Segment focus:**

- Telecoms
- Industry
- Medical equipment
- Energy

*ISO 9001, 14001 and ISO13485 certified*



Sweden

**Key competencies:**

- NPI centre
- Electronics assembly
- Box-build products
- High Level Assembly
- Test development
- Functional test systems
- Wireless technology (RF)
- Microelectronics

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# Manufacturing facilities

## Kaunas - Taikos 151

**Country:** Lithuania
**Manufacturing area**: 8 000 m$^2$
**FTE:** 261 (per August 2013)



Lithuania

**Segment focus:**

- Telecoms
- Defence/Aerospace
- Energy
- Industry
- Medical equipment
- Offshore/Marine

*FDA listed and QSR compliant*

**Key competencies:**

- Electronics assembly
- Cable harness
- Box-build products

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# Manufacturing facilities

## Kaunas - Užliedžiai

**Country:** Lithuania
**Manufacturing area**: 3 200 m$^2$
**FTE:** 70 (per April 2013)



Lithuania

**Segment focus:**

- Telecoms
- Defence/Aerospace
- Offshore/Marine

**Key competencies:**

- Cable harness assembly and repair
- Test
- Coating processes

*Dedicated site for cable harness assembly, test and repair*

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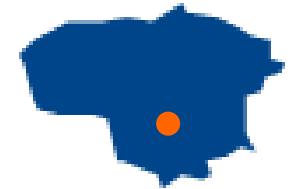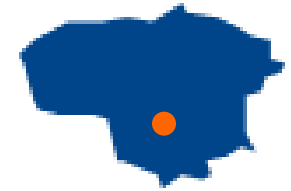# Manufacturing facilities

## Stuttgart

**Country:** Germany
**Manufacturing area**: 600 m$^2$
**FTE:** 17 (per August 2013)



**Segment focus:**

- Telecoms
- Defence/Aerospace
- Energy
- Industry
- Medical equipment

*Manufacturing of prototypes and small series EMS*

**Key competencies:**

- Electronics and backplane assembly
- NPI centre
- Functional test systems
- Wireless technology (RF)

Germany

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# Manufacturing facilities

## Ningbo

**Country:** China
**Manufacturing area**: 3000 m$^2$
**FTE:** 120 (per August 2013)

**Segment focus:**

- Medical equipment
- Industry
- Energy
- Offshore/Marine
- Data/Telecom

*ISO 9001/13485*

*A full scale manufacturing set up*



China

**Key competencies:**

- HLA, Box build
- PCBA assembly
    - SMT incl. AOI, X-ray
    - THT (selective, manual)
    - Test (ICT)
    - Cleaning, Coating
- Cable harness assembly

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# Manufacturing facilities

## Johnstown

**Country:** USA
**Manufacturing area**: 2000 m$^2$
**FTE:** 20 (per August 2013)



USA

**Segment focus:**

- Defence/Aerospace
- Medical equipment
- Industry

*Assembly, test and repair*

**Key competencies:**

- Mechanical assembly
- Electromech. assembly
- Cable harnessing
- HLA, Box build and systems
- PCBA
  - SMT and manual assembly  Q1/13

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**Kitron,
your long-term sustainable partner**