How ABB is organized
Five global divisions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Products</td>
<td>$10 billion</td>
<td>34,500 employees</td>
</tr>
<tr>
<td>Power Systems</td>
<td>$6.8 billion</td>
<td>19,100 employees</td>
</tr>
<tr>
<td>Discrete Automation and Motion</td>
<td>$5.6 billion</td>
<td>27,200 employees</td>
</tr>
<tr>
<td>Low Voltage Products</td>
<td>$4.5 billion</td>
<td>21,300 employees</td>
</tr>
<tr>
<td>Process Automation</td>
<td>$7.4 billion</td>
<td>28,400 employees</td>
</tr>
</tbody>
</table>

(2010 revenues)

ABB’s portfolio covers:

- Electricals, automation, controls and instrumentation for power generation and industrial processes
- Power transmission
- Distribution solutions
- Low-voltage products
- Motors and drives
- Intelligent building systems
- Robots and robot systems
- Services to improve customers’ productivity and reliability
## Discrete Automation and Motion division

### Business units

<table>
<thead>
<tr>
<th>LV Drives</th>
<th>Motors and Generators</th>
<th>Power Electronics and MV Drives</th>
<th>Robotics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low voltage AC drives</td>
<td>Synchronous motors</td>
<td>Power Electronics</td>
<td>Industrial robots</td>
</tr>
<tr>
<td>Machinery drives</td>
<td>Modular induction motors</td>
<td>Advanced power electronics</td>
<td>Robot controllers and software</td>
</tr>
<tr>
<td>Standard drives</td>
<td>Slip-ring motors</td>
<td>Converter products</td>
<td>Industrial software products</td>
</tr>
<tr>
<td>Industrial drives</td>
<td>Large exd motors</td>
<td>Excitation systems</td>
<td>Application equipment and</td>
</tr>
<tr>
<td>Wind turbine drives</td>
<td>High speed motors</td>
<td>High power rectifiers</td>
<td>accessories</td>
</tr>
<tr>
<td>DC Drives</td>
<td>Process performance motors</td>
<td>Power quality products</td>
<td></td>
</tr>
<tr>
<td>Solar converters</td>
<td>Special motors (exd, marine, etc.)</td>
<td>Traction converters</td>
<td>Robot automation systems for</td>
</tr>
<tr>
<td>PLCs, HMs, and wireless</td>
<td>General performance motors</td>
<td>Propulsion and auxiliary converters</td>
<td>automotive, foundry, packaging,</td>
</tr>
<tr>
<td>sensors and actuators</td>
<td>Industrial performance motors</td>
<td>Medium voltage drives</td>
<td>metal, solar, wood, plastics,</td>
</tr>
<tr>
<td>Software tools</td>
<td>Traction motors</td>
<td>Service</td>
<td>etc. industries</td>
</tr>
<tr>
<td>Energy saving tools</td>
<td>DC motors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td>Wind power generators</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diesel generators</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Service</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discrete Automation and Motion division
Making products work together
Together, we drive our customers’ industrial productivity and energy efficiency
Two channel market approach

Direct sales
- End Customers

In-direct sales
- Authorized Value Providers
- System Integrators
- Machine Builders (OEM’s)

Robots, Robot Cells, Systems, Service
Experience from 200,000 + robots installed

- Spot Welding: 20%
- Machine Tending & Materials Handling: 35%
- Arc Welding: 15%
- Spot Processing: 10%
- Painting: 8%
- Other Application: 12%
Markets served
Overview

- Automotive
- Foundry & Forging
- Metal fabrication
- Machine Tools
- Plastics & Rubber
- Food & Beverage
- Pharmaceuticals
- Transportation
- Electrical & Electronics (3C)
- Renewable Energy – Wind & Solar
Other industries served

- Electrical Machinery
- Mining
- Logistics
- Oil & Gas
- Glass
- Domestic Appliances
- Wood
- Medical & Optical
- Paper
- Building materials & Construction
- Defense & Aerospace
- Sanitary, Tableware & Ceramics
Robots Overview

- Comprehensive range from 1kg to 650kg payload capacity
- Articulated and parallel robots
- Robust, rigid, reliable, easy to use
- Customization through modular design concept
- Protection with IP67, Clean Room, Foundry Plus, Foundry Prime, Wash Down
Small robot family
Pay load 3kg to 20kg

<table>
<thead>
<tr>
<th>Pay Load</th>
<th>Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td>3kg</td>
<td>0.58m</td>
</tr>
<tr>
<td>IRB 120</td>
<td></td>
</tr>
<tr>
<td>6kg</td>
<td>0.81m</td>
</tr>
<tr>
<td>IRB 140 &amp; IRB 140T</td>
<td></td>
</tr>
<tr>
<td>5kg</td>
<td>1.44m</td>
</tr>
<tr>
<td>IRB 1410</td>
<td></td>
</tr>
<tr>
<td>4 kg</td>
<td>1.5m</td>
</tr>
<tr>
<td>IRB 1520</td>
<td></td>
</tr>
<tr>
<td>10kg</td>
<td>1.2/1.45m</td>
</tr>
<tr>
<td>IRB 1600</td>
<td></td>
</tr>
<tr>
<td>4kg</td>
<td>1.5m</td>
</tr>
<tr>
<td>IRB 1600ID</td>
<td></td>
</tr>
</tbody>
</table>
Medium robot family
Pay load 5kg to 60kg

<table>
<thead>
<tr>
<th>Payload</th>
<th>Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-16kg</td>
<td>1.5m</td>
</tr>
<tr>
<td>12kg</td>
<td>1.85m</td>
</tr>
<tr>
<td>12-20kg</td>
<td>1.65m</td>
</tr>
<tr>
<td>7kg</td>
<td>1.8m</td>
</tr>
<tr>
<td>8kg</td>
<td>2.0m</td>
</tr>
<tr>
<td>15kg</td>
<td>1.85m</td>
</tr>
</tbody>
</table>

- IRB 2400
- IRB 2400L
- IRB 2600
- IRB 2600ID
- IRB 2600ID
Medium robot family
Pay load 5kg to 60kg

<table>
<thead>
<tr>
<th>Payload</th>
<th>Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td>20kg</td>
<td>2.5m</td>
</tr>
<tr>
<td>40kg</td>
<td>2.55m</td>
</tr>
<tr>
<td>45-60kg</td>
<td>2.05m</td>
</tr>
<tr>
<td>60kg</td>
<td>1.95m</td>
</tr>
</tbody>
</table>

- **IRB 4400**
- **IRB 4600**
Large robot family
Pay load 90kg to 650kg*

<table>
<thead>
<tr>
<th>Payload (kg)</th>
<th>Reach (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>2.55</td>
</tr>
<tr>
<td>235</td>
<td>2.55</td>
</tr>
<tr>
<td>205</td>
<td>2.75</td>
</tr>
<tr>
<td>185</td>
<td>2.8</td>
</tr>
<tr>
<td>130</td>
<td>3.2</td>
</tr>
<tr>
<td>170-200</td>
<td>2.55/2.75</td>
</tr>
</tbody>
</table>
Large robot family
Pay load 90kg to 650kg*

<table>
<thead>
<tr>
<th>Payload</th>
<th>Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td>150kg</td>
<td>2.2m</td>
</tr>
<tr>
<td>205kg</td>
<td>1.9m</td>
</tr>
<tr>
<td>150kg</td>
<td>1.9m</td>
</tr>
<tr>
<td>130kg</td>
<td>3.1m</td>
</tr>
<tr>
<td>150-500kg</td>
<td>2.55/3.5m</td>
</tr>
<tr>
<td>90-200kg</td>
<td>3.0/3.9m</td>
</tr>
</tbody>
</table>

- **IRB 6620**
- **IRB 6620LX**
- **IRB 6650S**
- **IRB 6660 Pre Machining**
- **IRB 6660 Press Tending**
- **IRB 7600**

* 650kg capacity with wrist down
That was then, this is now: ABB introduces design and color change for the new era of robotics

The world of robotics has changed dramatically over the past 40 years, and now it is entering a new era. ABB Robotics is responding with a fresh look that better reflects this reality.

- **New design**: “Dynamic Design” language with unique forms and shapes
- **New color**: Orange is replaced with Graphite White on all standard robots starting May 2014
- **Suits the era of collaboration**: New design signals a shift to an era in which humans and robots work together
- **Signals a strong global brand**: ABB has a unique ability to deliver complete global solutions
NEW ROBOT FAMILY – IRB6700

IRB 6700
New generation of robots with a lifetime of affordability and reliability
IRB 6700
Seventh generation of robots

IRB 90 1982
IRB 6000 1990
IRB 6400 1994
IRB 6400R 1997

IRB 6600 2002
IRB 6640 2007
IRB 6700 2013
IRB 6700
Variants

High Line (235 kg)
- IRB6700-235/2.65
- IRB6700-205/2.80
- IRB6700-175/3.05
- IRB6700-150/3.20
- All variants available with Lean ID

Low Line (200 kg)
- IRB6700-200/2.60
- IRB6700-155/2.85
- All variants available with Lean ID

Power Line (300 kg)
SoP Q4 2014
- IRB6700-300/2.70
- IRB6700-245/3.00
- All variants available with Lean ID
Lowest TCO
Outstanding reliability

- Trusted design based on 30,000 units and 15 years production
- Each IRB 6640 failure report analyzed so IRB 6700 would not repeat
- Total Cost of Ownership model driving force behind redesign and incorporation of new solutions
- Main components only from world class suppliers
- Robot testing most stringent ever
  - Operation
  - Components
Lowest TCO
Doubled service intervals

As an average twice as long time between service

<table>
<thead>
<tr>
<th>Item</th>
<th>Interval Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear box oil change interval ax 1-3, 6</td>
<td>After 20000 h, quick connections on axes 1-3 to reduce time for draining / filling oil (ref 6000 h+24000 h)</td>
</tr>
<tr>
<td>Gear box oil change interval ax 4-5</td>
<td>After 20000 h</td>
</tr>
<tr>
<td>Battery change</td>
<td>After 4 years, 3 shift (ref at low alert after 2 years)</td>
</tr>
<tr>
<td>Counter balancing cylinder</td>
<td>Lubrication after 4 years, 3 shift (ref 2.5 years)</td>
</tr>
<tr>
<td>Gears life time</td>
<td>After 8 years &amp; 3 shift in normal BIW operation an inspection/overhaul is needed</td>
</tr>
<tr>
<td>Annual inspection</td>
<td>20 min, Gear box oil levels, harnesses, labels, balancing device, mech. Stops</td>
</tr>
</tbody>
</table>
Lowest TCO
One robot family: 150-300 kg payload

Ax 3-4 (x3)  Tube Shaft (x2)  Extender (x2)  Ax 5-6 (x3)

Cable Harness (x1)  Lower Arm (x4)

Balancing Device (x2)  Ax 1 (x2)  Ax 2 (x3)
IRB 6700
More output ....average is 4-5% faster than IRB 6640

- Based on simulations with
  - 600+ cycles from a car body shop &
  - Linear type cycles in (short to long) in X, Y and Z direction

IRB6640
Known as a high performing robot in 200 kg segment

IRB6700
4-5% faster versus IRB 6640
IRB 6700
15% reduced energy consumption

IRB 6640
A front runner in low energy consumption

IRB 6700
15% less energy needed than IRB 6640
IRB 6700
Only non hazardous materials used

- Fully complies with environmental directives RoHS 2002/95/EC and Reach No1907/2006 directives
Dedicated 4 axis robot family
Overview - picking, packing, palletizing

<table>
<thead>
<tr>
<th>High speed pickers</th>
<th>Top loader/ packer</th>
<th>Palletizers</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Serving fully integrated packing lines
Dedicated 4 axis robot family
High Speed Pickers

- Stainless Steel option
- Protection to IP55/67/IP69K
- Clean room ISO Class 5-7
- Wash down
Dedicated 4 axis robot family
Top Loaders & Palletizers

<table>
<thead>
<tr>
<th>Weight</th>
<th>Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td>30kg</td>
<td>1.5m</td>
</tr>
<tr>
<td>110kg</td>
<td>2.4m</td>
</tr>
<tr>
<td>180kg</td>
<td>3.15m</td>
</tr>
<tr>
<td>250kg</td>
<td>3.15m</td>
</tr>
<tr>
<td>450kg</td>
<td>3.18m</td>
</tr>
</tbody>
</table>

IRB 260
IRB 460
IRB 660
IRB 660
IRB 760

Standard Grippers
Robot control family
Overview

- Multi-robot control, up to 36 axis, with **MultiMove**
- Programmable user interface with joystick motion control with **FlexPendant**
- World leading motion control with **TrueMove & QuickMove**
- “Next generation safety” with **SafeMove**
- Powerful connectivity through network interfaces
- **Remote Service** option
Paint robot family
With dedicated controller

<table>
<thead>
<tr>
<th>Compact</th>
<th>Hollow Wrist</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRB 52</td>
<td>IRB 580</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process or Slim Arm</th>
<th>Car Body Painter</th>
<th>Paint Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRB 5400</td>
<td>IRB 5500</td>
<td>IRC5P for paint</td>
</tr>
</tbody>
</table>

All ABB paint robots, paint controllers and paint programming units are Explosion Protected. See data sheets for more information.
Robotics Paint
Product overview

IRB 5500
IRB 5400-22
IRB 580 (1620)
IRC5P
FlexPaint Pendant
Powered by IPS™

Rail systems
IRB 5400-12
IRB 580 (1220)
IRB 52
IRB 5310
IRB 5300

RB1000
EXT
CBS
Pump
Color-changer
2K mixer
RobView 5

ShopFloor
Editor

RobotStudio
Paint
Robot process & application equipment
Fully integrated with your robot

Paint

Dress Packs

Track Motion

Process Cabinets

Arc Welding

Spot Welding
Software
Delivering power & value

- Reduced risk of operator mistakes
- Less need for training
- Easy to use operator interfaces
- Application customization
- Introduction of program & testing offline
- Verifying new products quickly
- Remote monitoring of production
- Remote diagnosis of problems
- Easy to use programmer interfaces
Robot-based manufacturing cells

Overview

- Arc welding
- Spot welding
- Painting/coating
- Cutting
- Press tending
- Finishing
- Material handling
- Machine tending
Modular Manufacturing Cells & FunPacks
Global standardised robot-based solutions

<table>
<thead>
<tr>
<th>Arc Welding</th>
<th>Machining</th>
<th>Finishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>FlexArc</td>
<td>Machining FunPack</td>
<td>FlexFinishing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Washing</th>
<th>Palletizing</th>
<th>Painting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FlexWasher</td>
<td>PalletPack</td>
<td>Paint Application Pack</td>
</tr>
</tbody>
</table>
Automotive systems…
… via global lead centers

- Press Automation
- Body in White Assembly
- Paint Automation
- Powertrain Assembly
Products & systems
Overview

Robots
Comprehensive range with capacity from 1kg to 650 kg.

Application Equipment
Fully integrated for welding, handling, gluing, sealing, painting.

Software
To support robots & systems throughout their entire life-cycle.

Manufacturing Cells
Modular cells based on globally proven solutions.

Automotive Systems
Fully engineered for BiW, Paint, Powertrain & Press automation
Robotics Services
On your side during the entire robot life cycle

Our global service organization offers a complete portfolio of services designed to increase the performance, uptime and lifetime of your robot systems.
Service offer overview
A partnership for productivity improvement

Parts & Logistics
Comprehensive range with capacity from 1kg to 650 kg.

Field Services
Fully integrated for welding, handling, gluing, sealing, painting.

Training
To support robots & systems throughout their entire life-cycle.

Performance Services
Modular cells based on globally proven solutions.

Productivity Improvement
Fully engineered for BiW, Paint, Powertrain & Press automation
Service agreements
An offer targeting customer needs

- We offer four service agreement packages, supported by global processes and skilled dedicated people

- Includes wireless Remote Service technology
  - Partner Support Package
    Faster ramp-up during commissioning
  - Maintenance Package
    Maximize the MTBF
  - Response Package
    Minimize the MTTR
  - Warranty Package
    Control over Life-cycle cost.
A Life Cycle Approach Based on “Remote Service” technology

1. Faster ramp-up during commissioning
2. Increased uptime at lower cost:
   - optimized preventive maintenance plan
   - predictive maintenance based on remote measurements
   - immediate response and diagnostics in case of unplanned stops
3. Robot program back-up, securing business continuity
4. On-line access to robot condition status and reports
Practicing what we preach - ABB Motors

When it comes to robotics ABB is happy to practice what it preaches.

First robot installed in the foundry in 1974 and automated additional processes since then – welding, casting, pressing, winding, assembly and packing.

Today 19 robots keep the ABB Motors factory competitive despite competition from low-cost countries.
10 good reasons to invest in robots

Based on research carried out by the International Federation of Robotics (IFR)

1. Reduce operating costs
2. Improve product quality and consistency
3. Improve quality of work environment for employees
4. Increase production output rates
5. Increase product manufacturing flexibility
6. Reduce material waste and increase yield
7. Comply with safety rules and improve workplace health and safety
8. Reduce employee turnover and improve recruitment
9. Reduce capital costs (inventory, work in progress)
10. Save space in high value manufacturing areas
Competitor comparison

Kuka  
KR 6-2

Fanuc  
M-10iA

Motoman  
MH6-10

ABB  
IRB 1600
## Competitor comparison

### Data

<table>
<thead>
<tr>
<th></th>
<th>ABB IRB 1600-6</th>
<th>ABB IRB 1600-10</th>
<th>Fanuc M-10iA</th>
<th>Moto MH6-10</th>
<th>Kuka KR 6-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload, kg</td>
<td>6</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Total payload + armload, kg</td>
<td>36</td>
<td>30</td>
<td>22</td>
<td>N/A</td>
<td>36</td>
</tr>
<tr>
<td>Horizontal reach, mm</td>
<td>1,45</td>
<td>1,45</td>
<td>1,42</td>
<td>1,42</td>
<td>1,61</td>
</tr>
<tr>
<td>Vertical reach below foot, mm</td>
<td>0,72</td>
<td>0,72</td>
<td>0,97</td>
<td>0,78</td>
<td>0,38</td>
</tr>
<tr>
<td>Position repeatability (RP), mm</td>
<td>0,02</td>
<td>0,05</td>
<td>0,08</td>
<td>0,08</td>
<td>0,05</td>
</tr>
<tr>
<td>Path repeatability (RT), mm</td>
<td>0,19</td>
<td>0,13</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Standard protection</td>
<td>IP 54</td>
<td>IP 54</td>
<td>IP 67/54</td>
<td>IP 54</td>
<td>IP 65</td>
</tr>
<tr>
<td>Foundry protection</td>
<td>IP 67 ++</td>
<td>IP 67 ++</td>
<td>IP 67/55</td>
<td>IP 54</td>
<td>IP 65</td>
</tr>
<tr>
<td>Power consumption, kVA (kW)</td>
<td>1,08 (0,57)</td>
<td>1,08 (0,58)</td>
<td>N/A</td>
<td>1,50</td>
<td>7,3</td>
</tr>
<tr>
<td>Noise level, dB (A)</td>
<td>&lt; 70</td>
<td>&lt; 70</td>
<td>N/A</td>
<td>N/A</td>
<td>&lt; 75</td>
</tr>
</tbody>
</table>

- **Best or available**
- **2nd best or available**
- **Worst or not available**
Power and productivity for a better world™