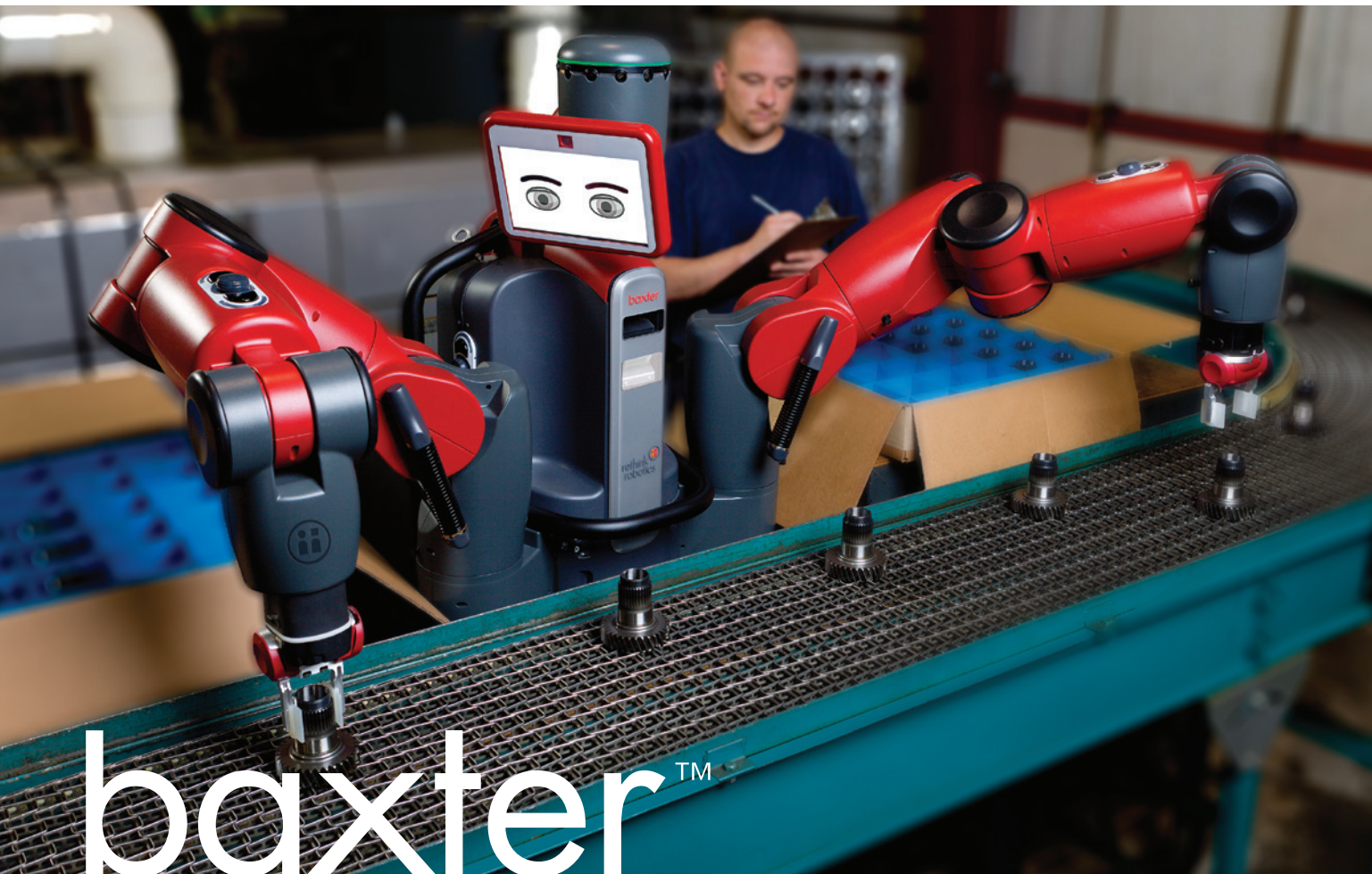


rethink 
robotics



baxter™

rethink manufacturing.
rethink offshoring.
rethink robotics.



Robots with Common Sense™

Meet **baxter**™

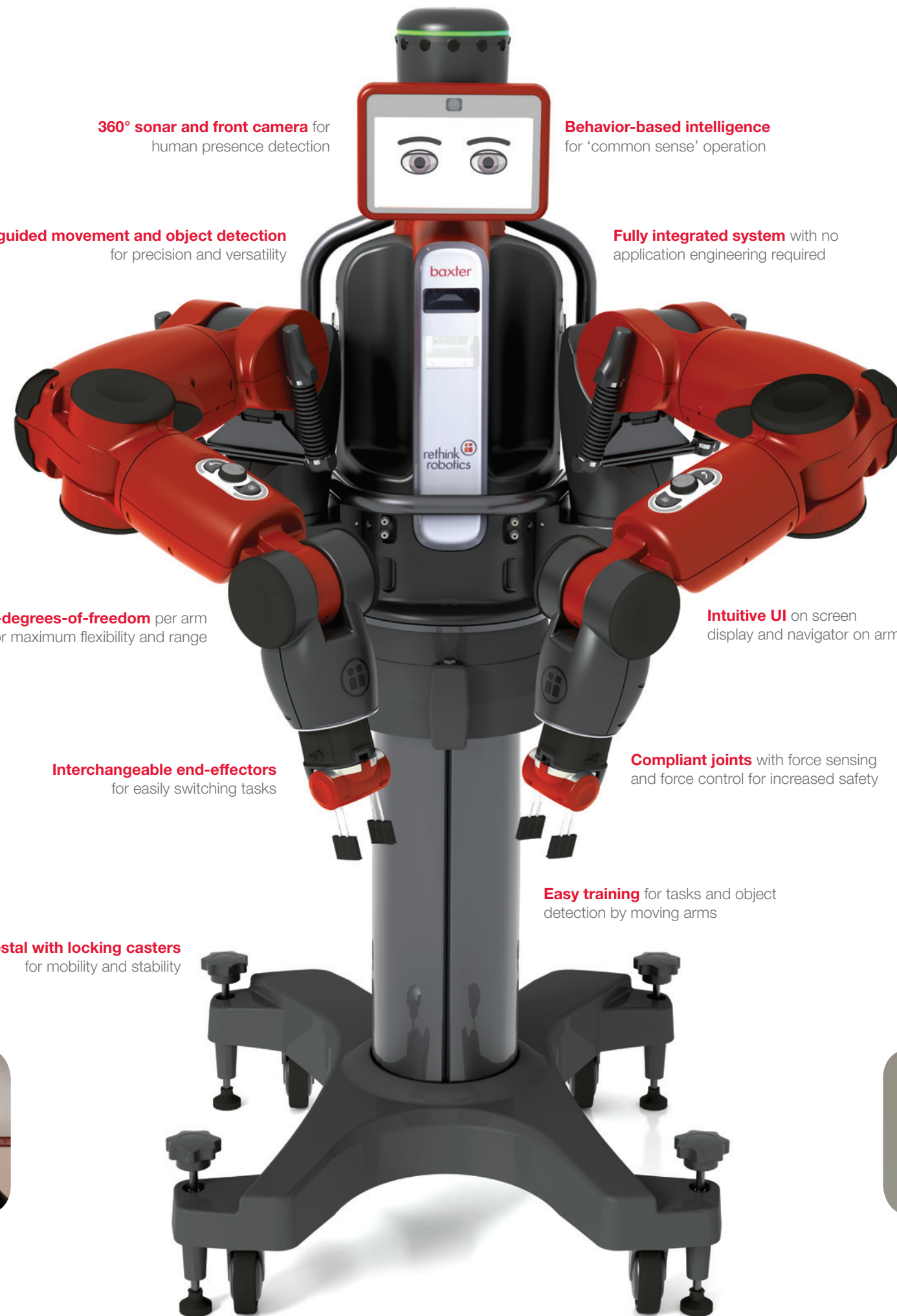
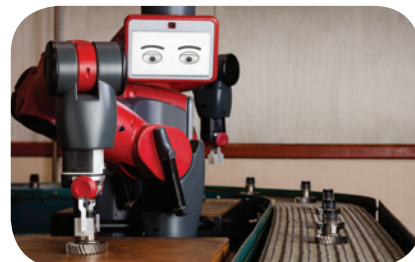
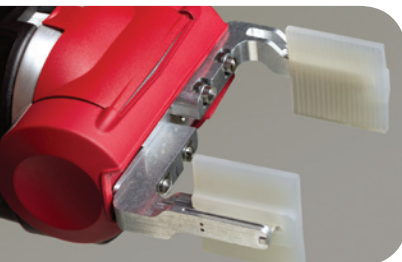
Adaptive Robot for Manufacturing Applications.

Baxter is a revolutionary new category of robot that is redefining the way robots can be used in manufacturing environments. It performs a variety of simple, yet critical production tasks while safely and intelligently working next to people. How? Unlike traditional industrial robots, Baxter exhibits behavior-based 'common sense,' capable of sensing and adapting to its task and its environment. It requires no complex programming or costly integration. And with its uniquely low price point, Baxter provides a compelling alternative to low-cost offshoring for manufacturers of all sizes. As a result, Baxter is being introduced into a wide range of plants that could never previously consider a robotic automation solution.

Performs a Broad Range of Simple Production Tasks.

Baxter can handle many repetitive production tasks that are typically difficult or expensive to automate, freeing human operators to focus on more value-added jobs. Baxter's initial release software includes functionality for basic discrete part handling, simple line loading/unloading, and basic packing and unpacking tasks, with more complex features and enhanced performance to follow. With future software updates, Baxter will be capable of a wide range of tasks, including:

- Material Handling
- Machine Tending
- Testing & Sorting
- Light Assembly
- Finishing Operations



360° sonar and front camera for human presence detection

Behavior-based intelligence for 'common sense' operation

Vision-guided movement and object detection for precision and versatility

Fully integrated system with no application engineering required

7-degrees-of-freedom per arm for maximum flexibility and range

Intuitive UI on screen display and navigator on arm

Interchangeable end-effectors for easily switching tasks

Compliant joints with force sensing and force control for increased safety

Pedestal with locking casters for mobility and stability

Easy training for tasks and object detection by moving arms

A New Opportunity to *In-Source*.

As rising costs and increasing demand continue to push manufacturing overseas, Baxter provides a low-cost, high-return alternative to offshoring. By using it to keep those processes in-house with Baxter, manufacturers can ramp up production more cost effectively, protect intellectual property, streamline supply chains and enable a more productive, satisfied and well-trained workforce.

What Makes Baxter Different?

Baxter is a groundbreaking solution for manufacturers of all sizes. In addition to its uniquely low price point, Baxter offers six fundamental differences that distinguish it from traditional industrial robots.

- 1 No programming.** Line workers can train Baxter in minutes, with no expertise in software, robotics or engineering required. In addition, Baxter retrains quickly for fast line changeovers.
- 2 No safety cages.** Baxter was designed with a comprehensive safety system which makes it feasible for working without barriers and in close proximity to people in a production environment.
- 3 No integration.** Baxter is a complete system (hardware, software, controls, UI, safety, sensors) that can be taken out of the box, trained and working in under an hour.
- 4 Works intelligently.** Baxter is designed and programmed to perform a wide range of manufacturing and production tasks; it is aware of its environment, and automatically adjusts to changes.
- 5 Versatile and capable.** Baxter was designed to perform simple, repetitive tasks quickly and efficiently, freeing people to focus on higher-level, more value-added activities.
- 6 Extensible platform.** Baxter is a complete, yet fully extensible platform which includes all necessary software, with updates provided regularly to enhance capabilities and performance. Our Software Development Kit (SDK) will enable custom programming of specialized and proprietary tasks.



baxter™ By Rethink Robotics.

Features	Capabilities and Benefits	Technical Specifications
Fully integrated system	<ul style="list-style-type: none"> No separate controller, pendant, safety cages or other devices required Ready to use out of the box, with no application engineering needed 	<p>Performance</p> <ul style="list-style-type: none"> Rated payload: 5 lbs (2.3 kg) — higher payloads possible in limited workspace Maximum speed with no payload: 3.3 ft/s (1 m/s) Maximum speed with rated payload: 2 ft/s (0.6 m/s) Up to 8-12 pick & place operations/min (total, incl. both arms)
Behavior-based intelligence	<ul style="list-style-type: none"> Inherently capable of responding to real-world inputs in a 'common sense' manner (e.g., recognizing it must have an object in its hand before moving and releasing it) Adaptable to varied conditions and tasks 	
Trainable by demonstration	<ul style="list-style-type: none"> Quick and easy 'training' by moving arms and joints as needed, with no programming required 'Face' screen guides user through the process and indicates the robot's status and understanding of the task 	<p>Electrical Connections</p> <ul style="list-style-type: none"> Supply voltage: 120 Volts Alternating Current Rated current: 10 Amps Rated life: 6,500 hours I/O connections: 1 Ethernet jack, 1 USB type A jack, 1 15 pin D-sub with PLC-compliant connections
Vision-guided and direct transfer capabilities	<ul style="list-style-type: none"> Supports a wide range of part types and locations Vision guided detection adapts to variations in part size, placement, conveyor speed, etc. for increased versatility Trainable to pick up objects from pre-set locations for faster performance on simple part transfer tasks 	
Comprehensive, easy-to-use software	<ul style="list-style-type: none"> Intuitive, user-friendly interface guides interaction and training Pre-programmed for common manufacturing tasks, with frequent updates provided to increase performance and support more complex processes Software Development Kit (SDK) will enable customization and increased programming flexibility 	<p>Environmental</p> <ul style="list-style-type: none"> Protection classification: IP50 Operating temperature range: 32-104 °F (0-40 °C)
Human form and proportions	<ul style="list-style-type: none"> Two, 7-degree-of-freedom arms provide excellent dexterity and range Each arm can run separate tasks or the same task to double capacity Optional pedestal provides easy mobility between workstations 	
Comprehensive safety design	<ul style="list-style-type: none"> Inherently safe design, with compliant joints, back-drivable motors, protective covers and no pinch points Human collision detection to minimize contact force Emergency stop mechanisms and connectivity to external systems provide additional safeguards as needed 	<p>Physical</p> <ul style="list-style-type: none"> Robot height: 3'1" (93.98cm) (without optional pedestal) Robot height (with optional pedestal): 5'10"–6'3" (1.78m–1.9m) depending on adjustable pedestal settings Arm length to end-effector plate: 41" (104cm) Torso mounting plate diameter: 13.3" (33.85cm) — for mounting on table Body weight, without pedestal: 165 lbs (75 kg) Degrees of freedom: 14 (7 per arm)
Complex sensing of people, parts and environment	<ul style="list-style-type: none"> 360° sonar-based detection of people and environment 5 cameras for detecting and recognizing objects, parts and workspace Through force detection, can 'feel' contact with objects and work surfaces 	
Interchangeable end-effectors	<ul style="list-style-type: none"> Electric parallel grippers and vacuum cups available Custom end-effectors will be available via third-party providers for additional specialization and flexibility 	<p>End-Effectors</p> <ul style="list-style-type: none"> Vacuum cup with interchangeable cups Electric parallel gripper with interchangeable 'fingers' and user-adjustable 'fingertips'
		<p>Optional Pedestal</p> <ul style="list-style-type: none"> Pedestal footprint: 36"x32" (92x81cm) Pedestal weight: 141 lbs (64 kg)
		<p>Warranty</p> <ul style="list-style-type: none"> One year warranty & software subscription included Extended warranty (3-year coverage) available

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