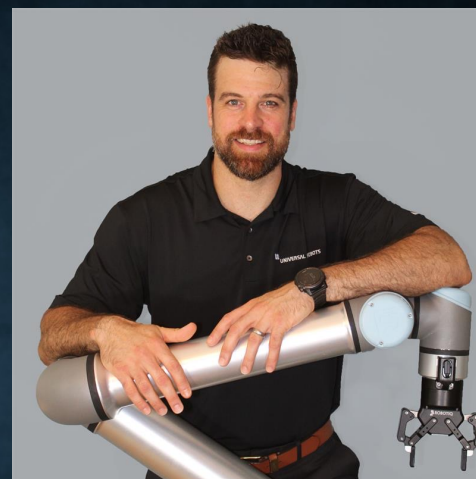


Getting Started with Cobot Automation in Laser Marking Operations



Silas Neale

*Area Sales Manager
North America East
Universal Robots*



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 **UNIVERSAL
ROBOTS**

Flexxbotics™

Agenda

- 1 Introduction to Universal Robots**
- 2 Comparison of traditional industrial robots and collaborative robots**
- 3 Cobot selection**
- 4 Getting started with cobot deployment for Laser Marking**

Introduction to Universal Robots

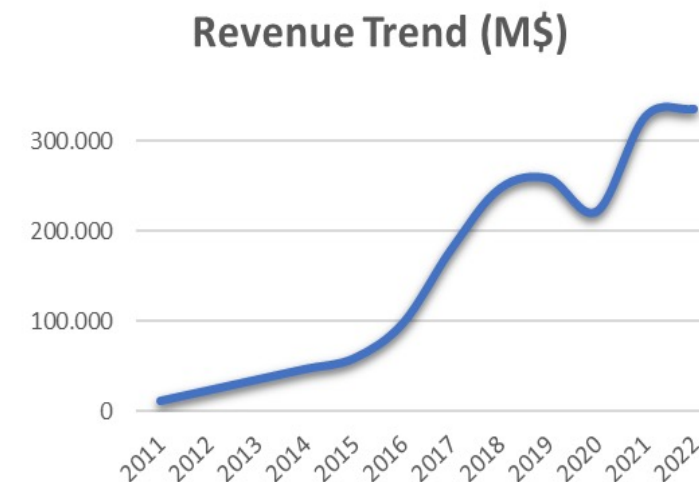
Company overview



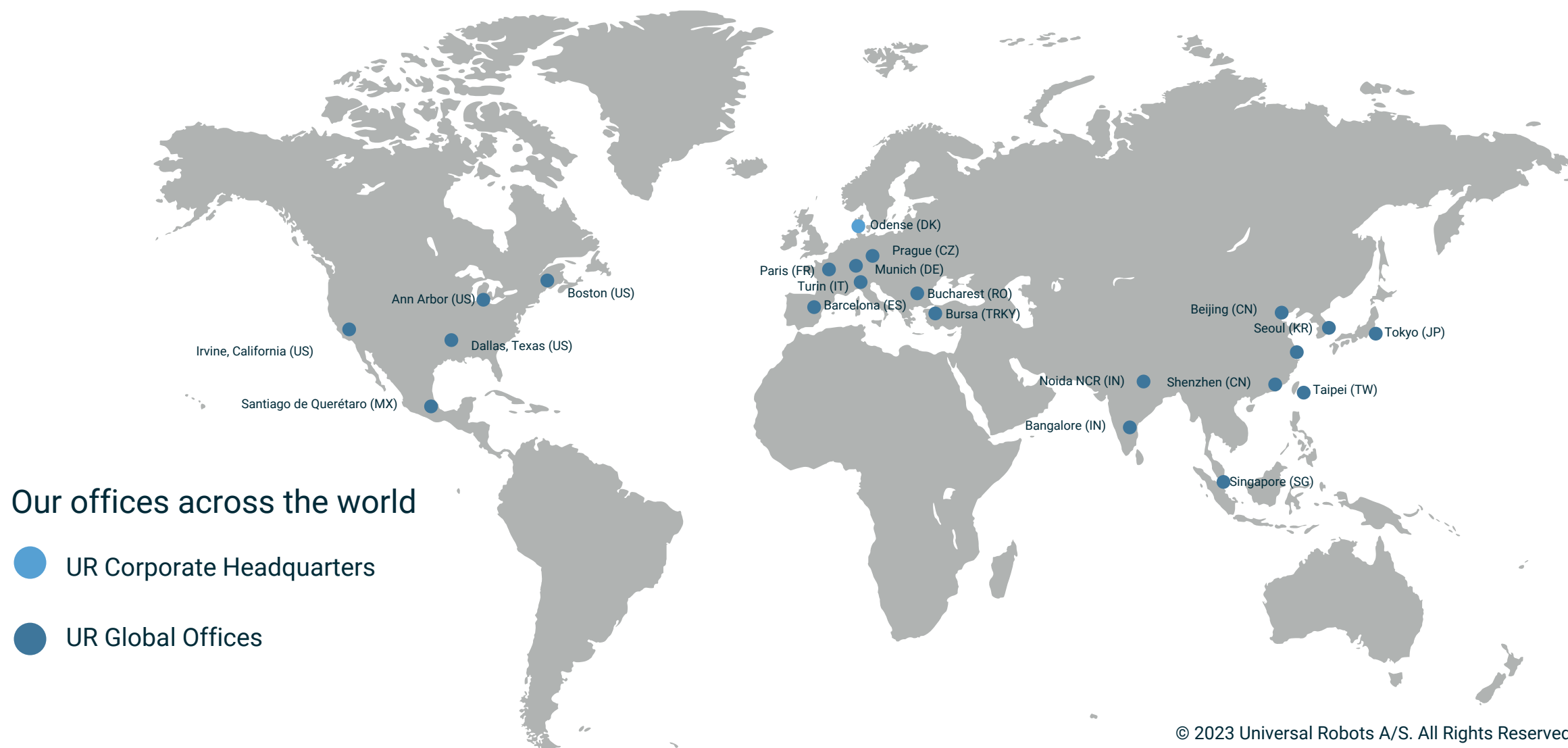
Kim Povlsen
CEO and President

2005 Founded in Denmark	2008 Introduced first commercially viable cobot
~29% of the cobot market	75,000+ cobots sold
1200+ Partners in the UR ecosystem	20+ offices
~1000 employees	Part of Teradyne Inc.

Product portfolio
with range of reaches and payloads

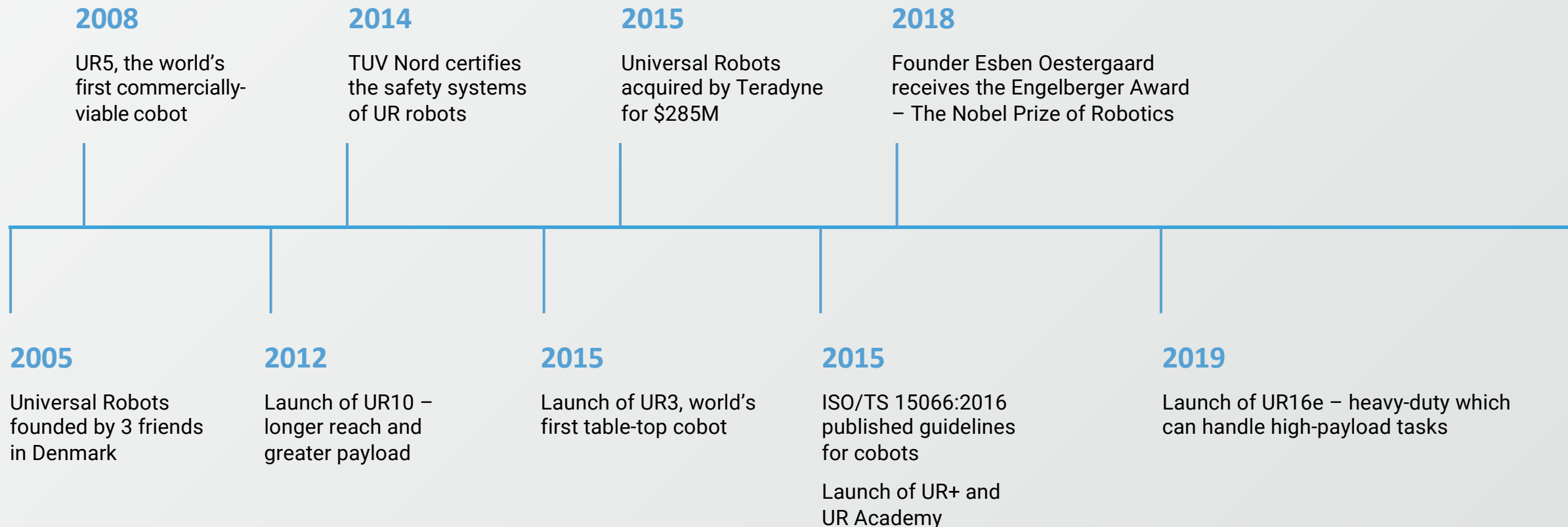


A global company



Our journey

to creating a world where people work with robots, not like robots



Our journey

2020

Universal Robots reaches an industry milestone with over 50,000 collaborative robots installed worldwide

2022

UR20 is announced – a new 20 kg payload cobot, which is the first of an innovative next generation of cobots

2023

75,000 cobots installed around the world

2021

The payload of the UR10e is increased to 12.5 kg (27.55 lbs)

2022

Together with its sister company MiR, Universal Robots breaks ground for a new, state-of-the-art headquarters in Odense

2023

The UR30 is launched at iREX in Japan on November 29. A more compact and powerful cobot compared to the UR20



**We want to create a world
where people
work with robots,
not like robots**

Traditional vs. collaborative automation

Traditional automation



Collaborative automation



Robot vs. cobot installation

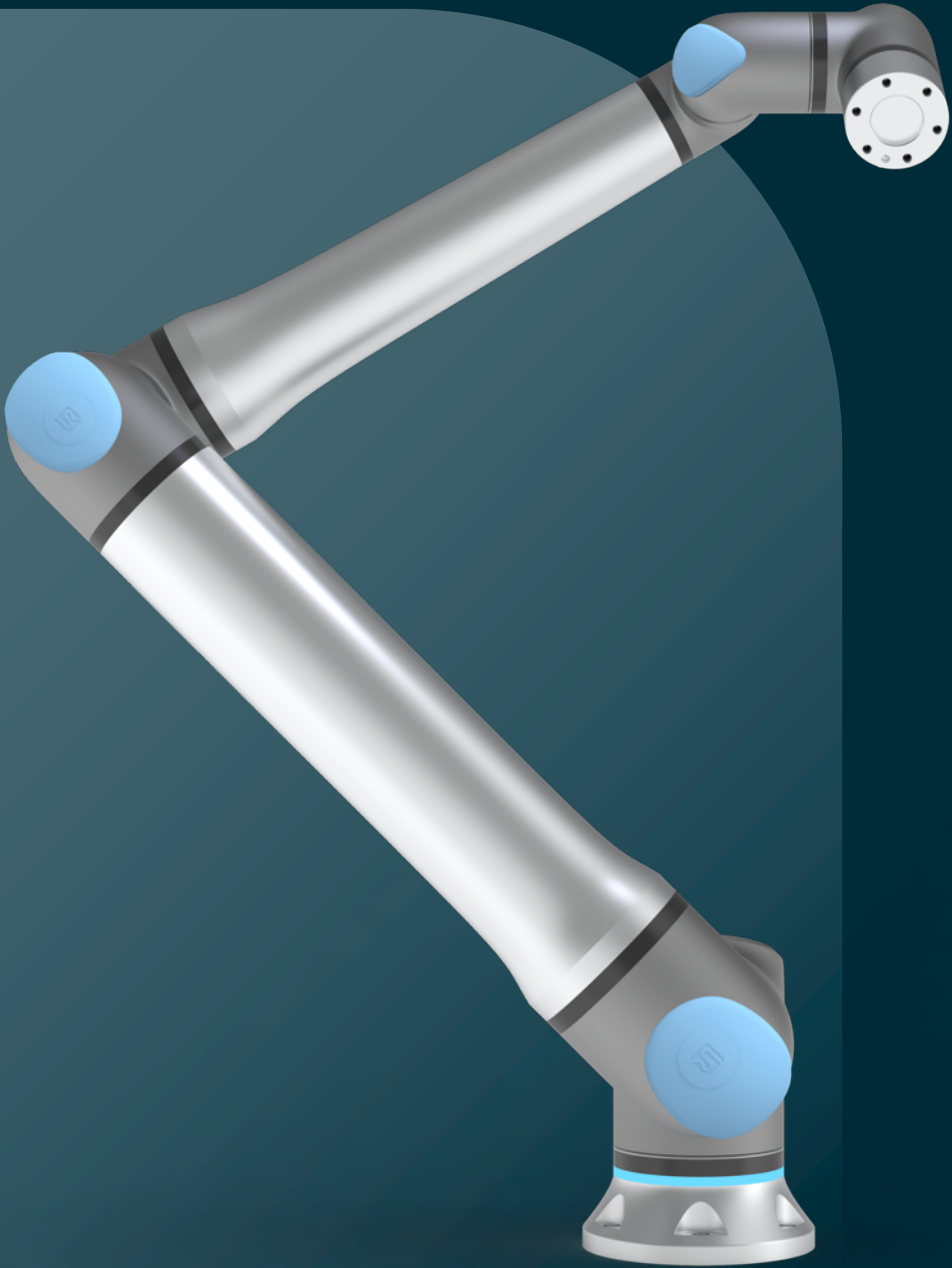
Typical Robotic System Lead-Time & Installation

- 1-12 Weeks ARO for Robot
- 4-18 Weeks ARO for Solution
- Running in 1-4 Weeks After Delivery
- 6-34 Weeks Total (1.5-9 months)

Typical Collaborative System Lead-Time & Installation

- 5-10 Days ARO for Robot
- 2-4 Weeks ARO for Solution
- Running in 1-5 Days After Delivery
- 3-10 Weeks Total (1-3 months)

Avg. 50% Faster Implementation Time Overall @ 30% - 50% Less CapEx Than Traditional Industrial Robot



Industrial Cobot Basics

Collaborative & safe

Able to safely operate alongside humans in shared space.

Easy to program

No previous coding / robotics / automation experience required.

Fast Setup

120v power, simple out-of-box experience.

Flexible & Versatile

Easy to redeploy into new applications or new production runs.

Total System Cost

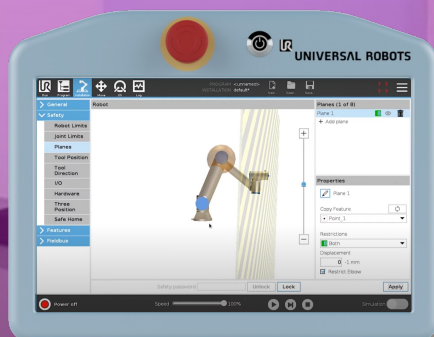
Typically, 1/3 to 1/2 of traditional automation.
Economically viable in high mix / low volume operations

Safety Function to Meet Individual Plant Requirements

17 safety functions

All EN ISO 13849-1, ISO 10218-1 Cat. 3, PL d, certified by TÜV NORD

- Configurable stopping time & stopping distance
- Joint position limits
- Pose limit, tool orientation limit, safety planes, safety boundaries
- Safe home
- Force limiting (TCP)
- Elbow safety (force, speed, boundary restriction)



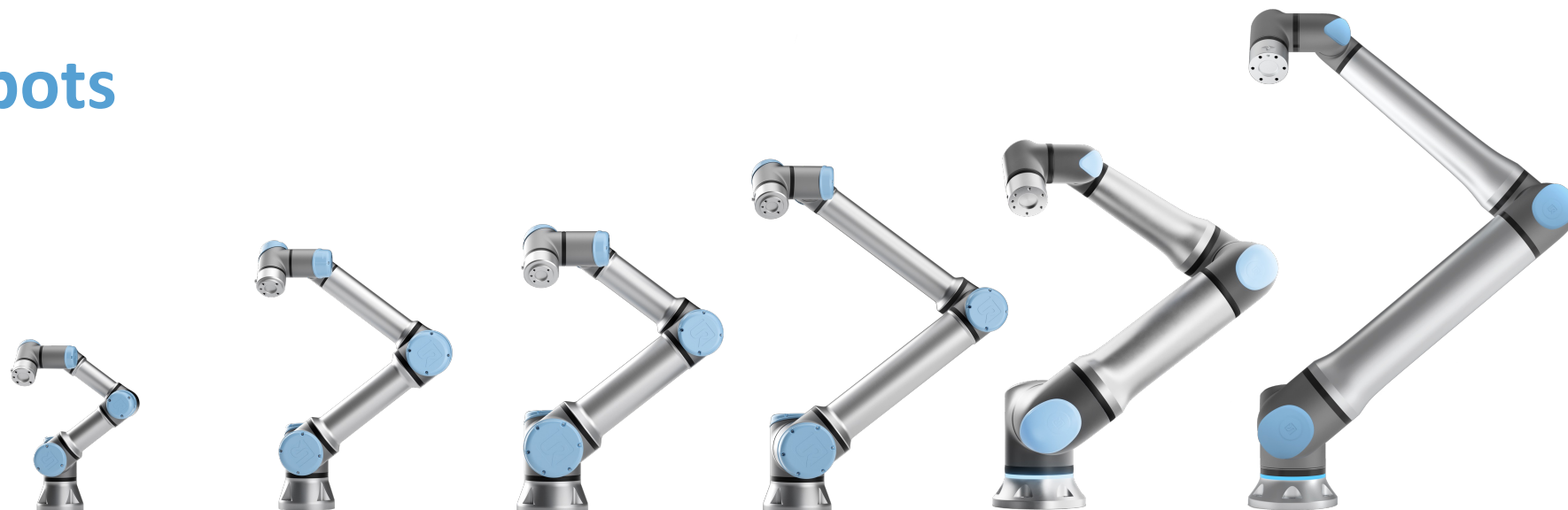
All-or-nothing VRS Incremental Automation



Cobot Selection

03

Universal Robots Portfolio

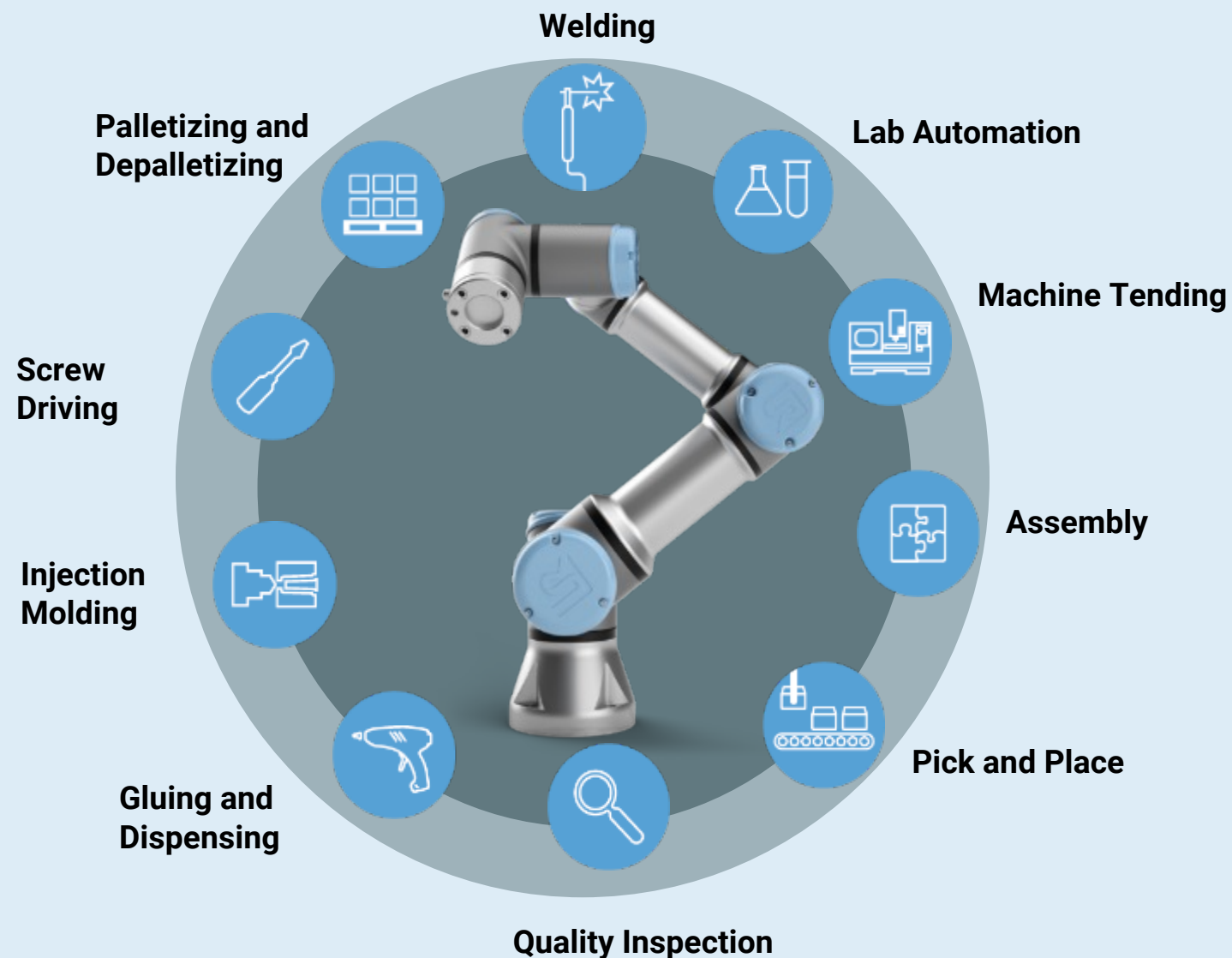


	UR3e	UR5e	UR16e	UR10e	UR30	UR20
 Payload:	3 kg 6.6 lbs	5 kg 11 lbs	16 kg 35.3 lbs	12.5 kg 27.5 lbs	30 kg 66.1 lbs	20 kg 44.1 lbs
 Reach:	500 mm 19.7 in	850 mm 33.5 in	900 mm 35.4 in	1300 mm 51.2 in	1300 mm 51.2 in	1750 mm 68.9 in
 Weight:	11.2 kg 24.7 lbs	20.6 kg 45.4 lbs	33.1 kg 73 lbs	33.5 kg 73.9 lbs	63.5 kg 139.9 lbs	64 kg 141.1 lbs
 Footprint:	Ø 128 mm	Ø 149 mm	Ø 190 mm	Ø 190 mm	Ø 256 mm	Ø 245 mm

Getting started with cobot deployment

Where to Start?

- **Business Challenges**
- **Manufacturing Labor**
- **Motion Classes**
- **Part Presentation**
- **Risk**
- **ROI**



Find the Business Problem

Improving the Bottom Line:

- Increase machine utilization, OEE, OLE.
- Avoid buying additional machinery, increasing floor space.
- Reduce Cost-of-Quality
- Reduce overtime & hours worked.
Avoid adding a 2nd or 3rd shift.
- Lower costs, increase margin or lower prices to gain market share.

Increasing the Top Line:

- Increase output without increasing manufacturing labor.
- Increase capacity to maintain & grow with current customers.
- Increase capacity to add new customers.
- Expand product lines

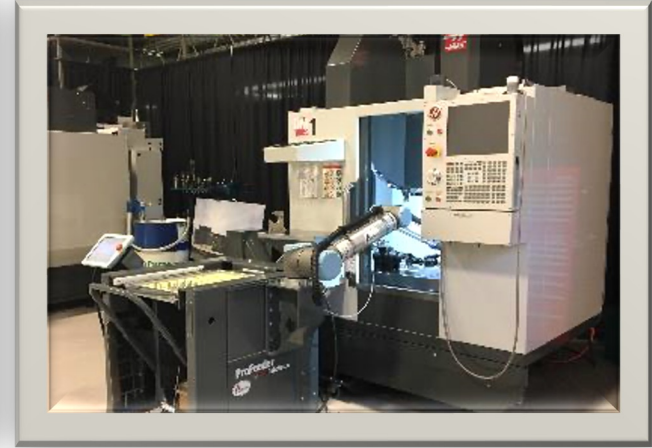
Throughput versus Cycle Time

- Cycle times are important, but total production is what counts
- Collaborative robots are not “*superhuman*”
- Built to preform Human Speeds & Payloads:
 - 6-10 cycles per min or less
 - Payloads Under 66 lbs.
- Production improvements from:
 - Consistent cycle times, quality improvements
 - Unmanned production at breaks, lunches, shift changes, extended work hours

Parts and Presentation

Positive Part Locations Preferred!

- Flat tray
- Located Tray
- Pegboard
- Conveyors
- Drawers
- Bowl Feeder
- Blow Feeder
- Re-Gripping Stations



Where to start: The factory tour

Human Tasks That Are...

- Dull, Dirty and Dangerous
- Difficult to Staff
- Workers Comp Claims
- Highly Repetitive
- Inconsistent Quality



Coarse vs. Fine Movement

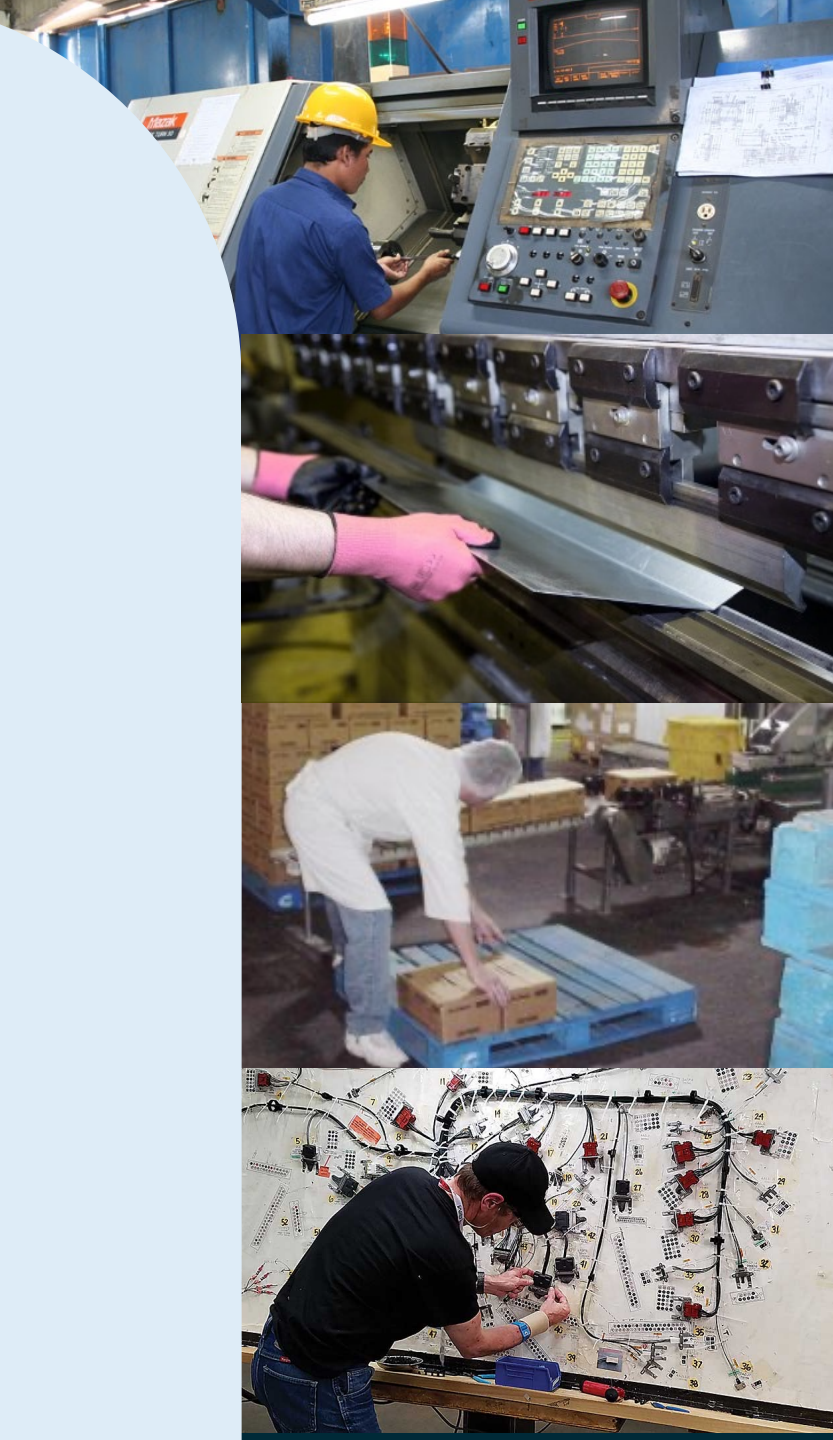
Coarse Movement

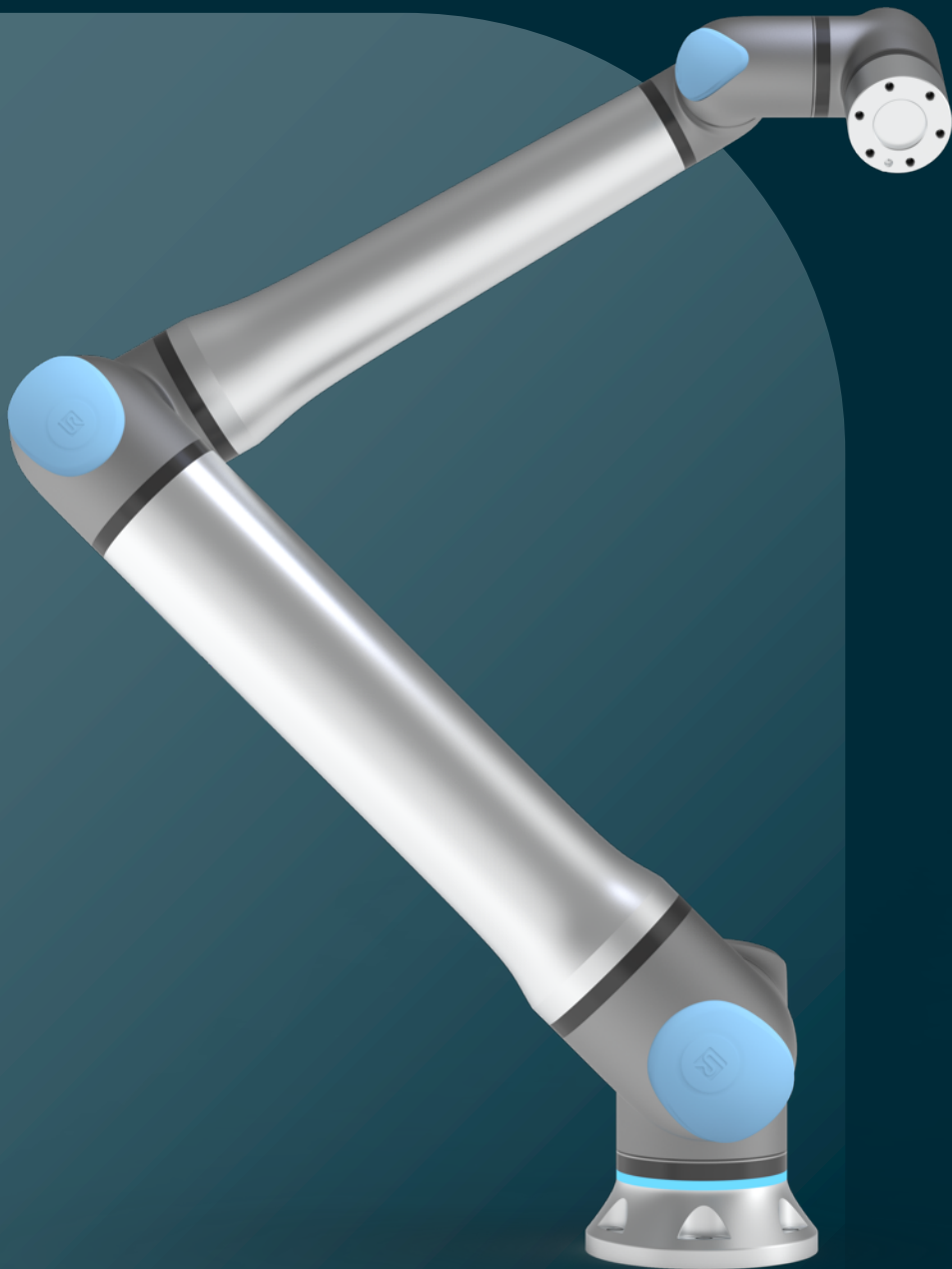
- Gross Motor Skill Movements, Large Muscles, Arms, Legs, Torso etc.
- Moving Boxes, Holding Torque & Glue Guns, Stacking, Packing, Transferring etc.

Fine Movement

- Small Movements, Small Muscles, Fingers, Toes, Wrists etc.
- Tying, Threading, Sewing, Folding, Wrapping, Manipulating Flimsy or Compliant Material To Fit

Primary Targets? *Coarse Movement*





Thank you!

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