

INVERT ROBOTICS

Industrial Inspections
Every Surface, Every NDT

Jan Erik Bree
April 2022





Agenda



- Invert Robotics
- The Company



- The Robots
- Types
 - Technical Details



- Payload Examples
- Visual – Camera
 - UltraSonic Payloads
 - Laser Surface Scanner
 - Additional NDT payloads



Introduction



Invert Robotics is an International Robotics & Inspection Company incorporated in Ireland



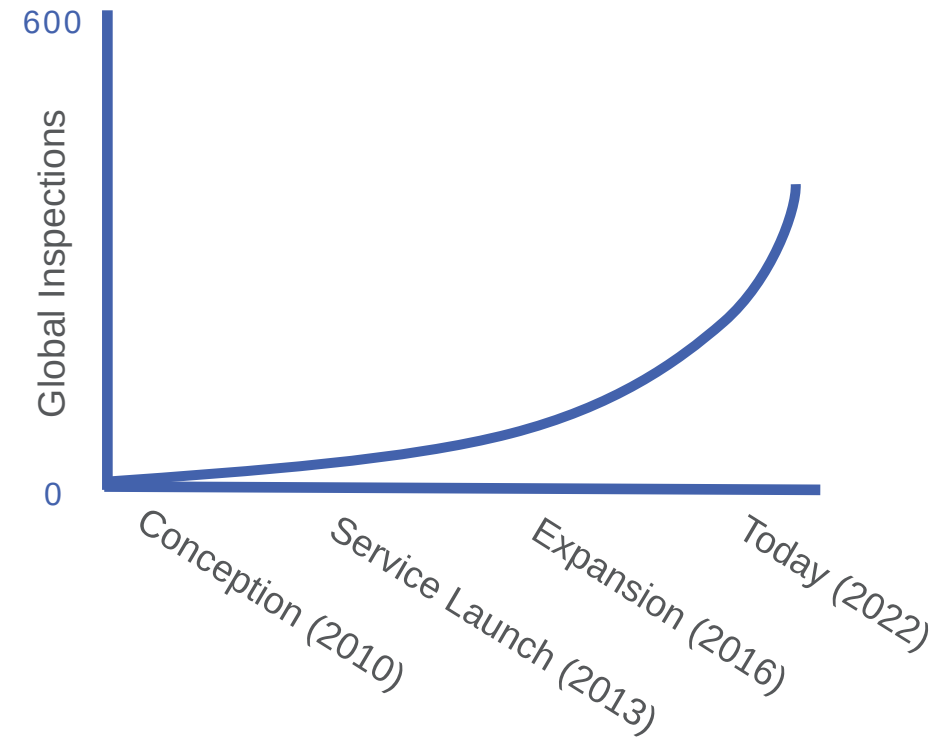
Bases in Ireland, Germany, the Netherlands, France, Ireland, USA, Australia and New Zealand



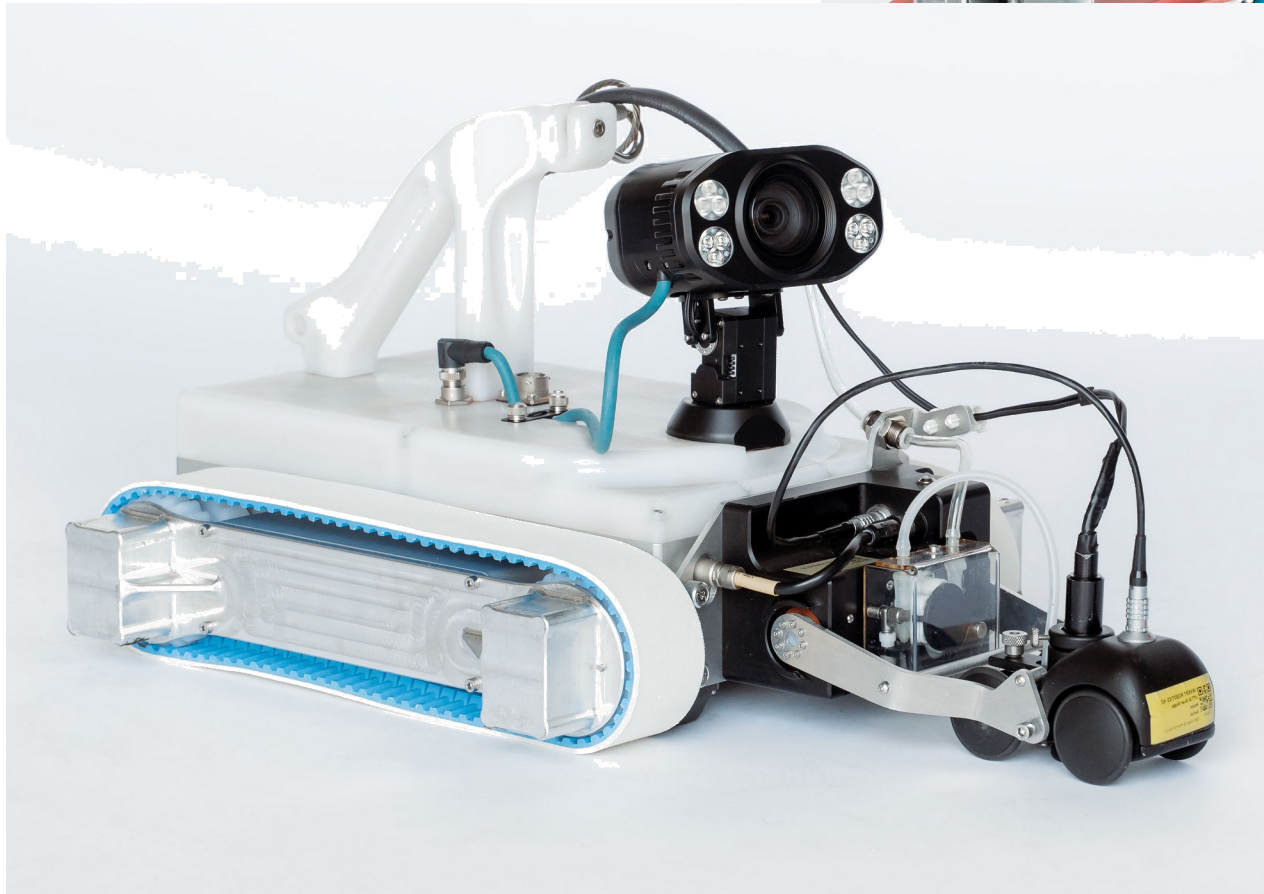
Accounts in Food & Beverage, Chemicals, Pharma, Aviation, Oil & Gas, Energy & Mining



Partner in Industry 4.0 international initiatives (Sprint Robotics, RIMA, a.o.)



Crawler Technology

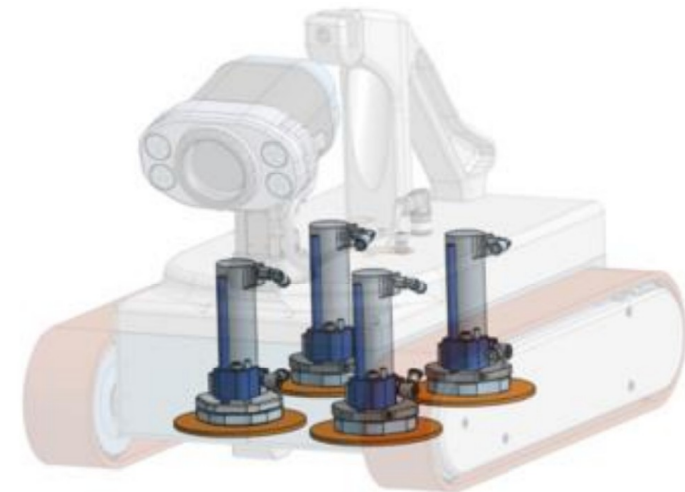


Vacuum Robot Crawler



BM1.1 Vacuum Robot configuration

- HD video camera (1080p)
- Dimensions: 30 cm x 40 cm x 29 cm
- Weight: 7 kg
- Payload Capacity 4 kg

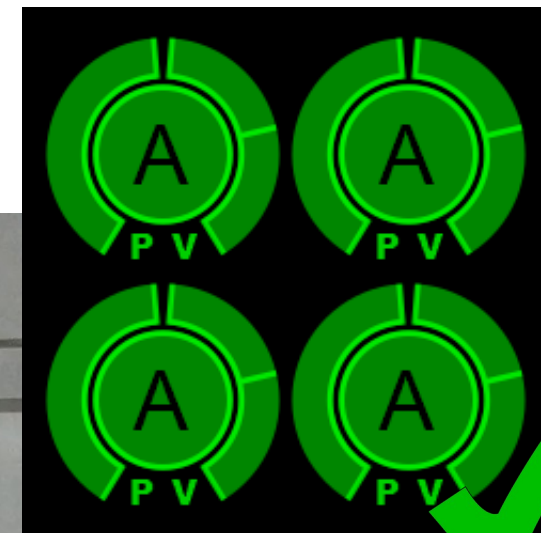
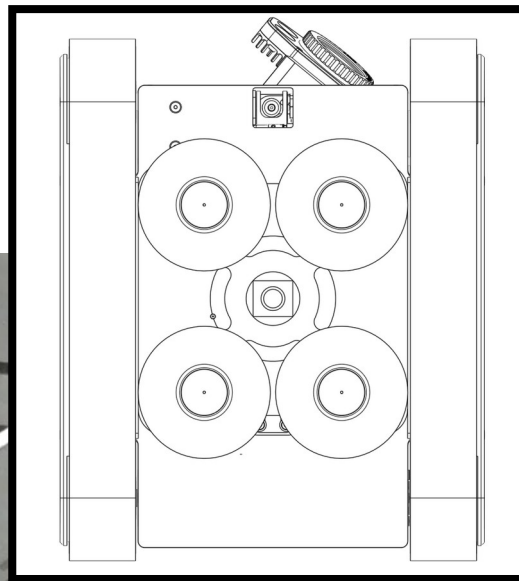




Welds/Joints



1. Toggle to belly-cam
2. Front pads over weld
3. Re-prime front pads
4. Drive on
5. Pause to re-prime back pads and away



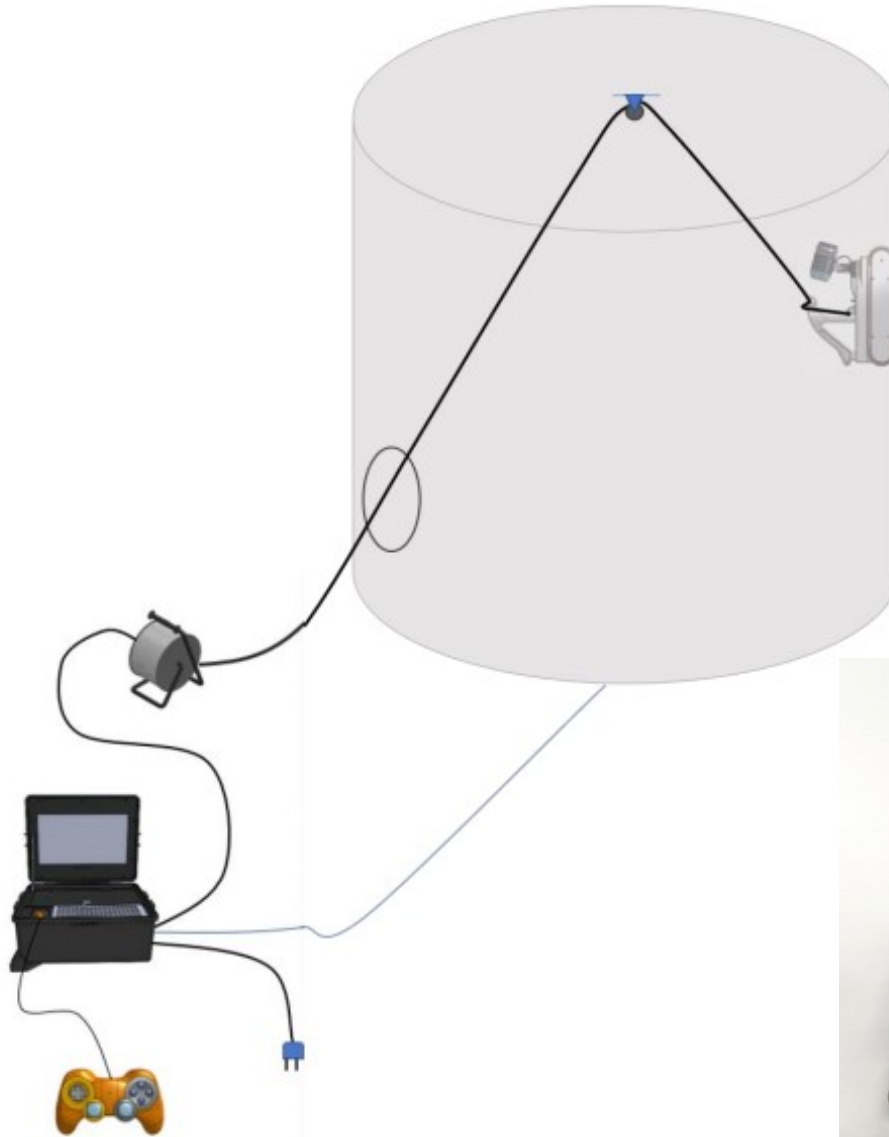


Umbilical Cable



Serves Triple Purpose

1. Safety Line if Robot detaches
2. Power Supply. Robot carries no battery
3. Data Cable. Robot does not store data. Signals are transmitted uncompressed



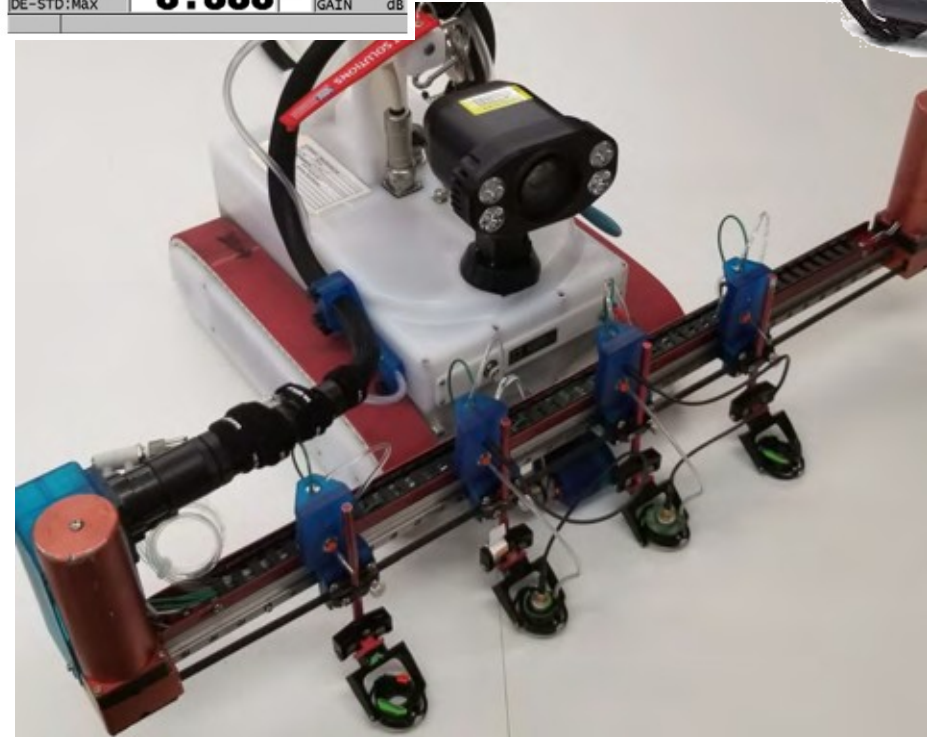
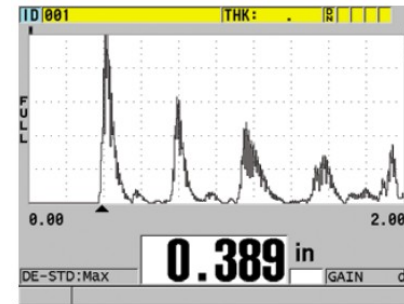
Invert Robotics Applications & Surfaces



Invert Robotics - Payloads

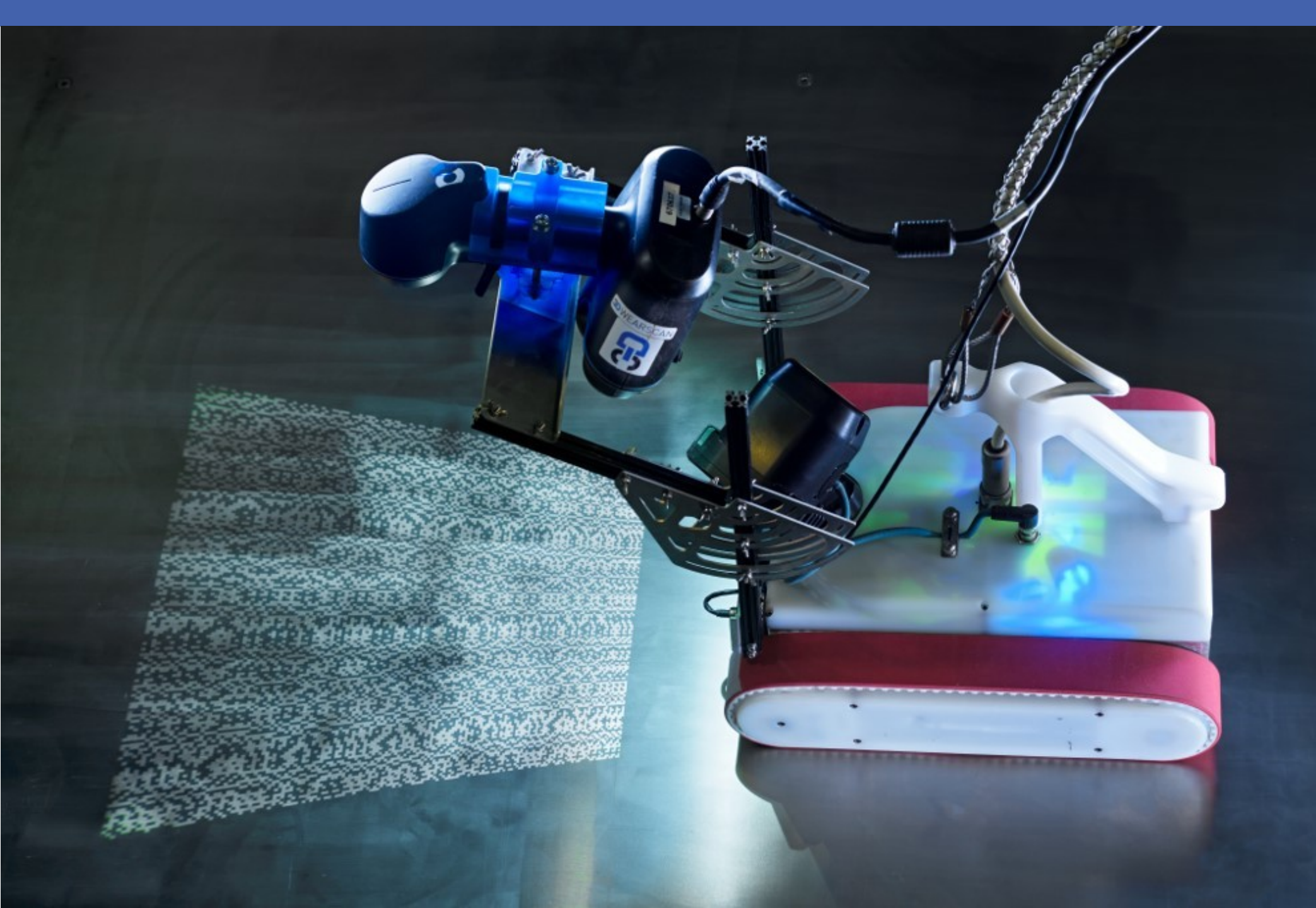


UT Scanners





Structured Light 3D scanner



Thursday, 17 Sep 2020
11:24:45
Nouryon Hengelo
Salt Plant E - Evaporator G6 3D-scan

1.00x
ZOOM



Go!SCAN 50 - 670637

Disconnected

Positioning Parameters

Positioning method

Targets only

Targets / Geometry

Targets / Geometry / Texture

Semi-rigid object

Show positioning status

Scanner Parameters

Automatic shutter

Capture texture

General Display

Texture display

Without shading

With shading

Material glossiness

8.0

Clip view

50

Quick rendering while moving

Show isolated patches

Show origin

Show viewpoint reference

Show linear scale

Viewer font size

8

Mesh Display

Shading

Flat

Display as

Triangles

Wire frame

Triangles and wire frame

Transparent triangles

Point Cloud

Show boundaries

File

Tools

View

Configure

Help

Scan

Resume scan

Preview

Delete frames

Reset Scan

Remove Background

Add Clipping Plane

Use Clipping Reference

Delete

Apply texture

Merge scans

View texture

Move projection

Basic Entities

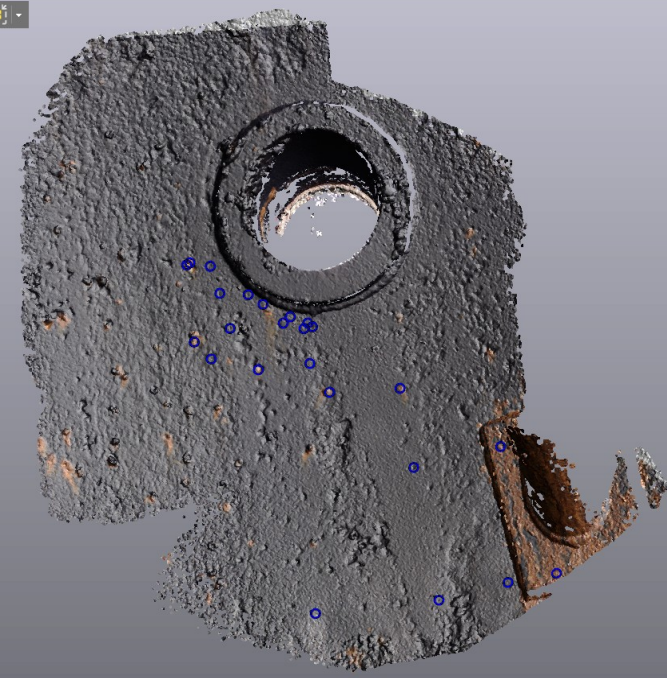
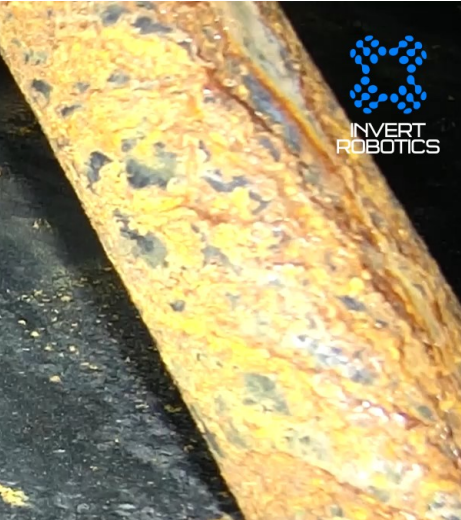
Basic Alignments

Inspect Mesh

Add Scan

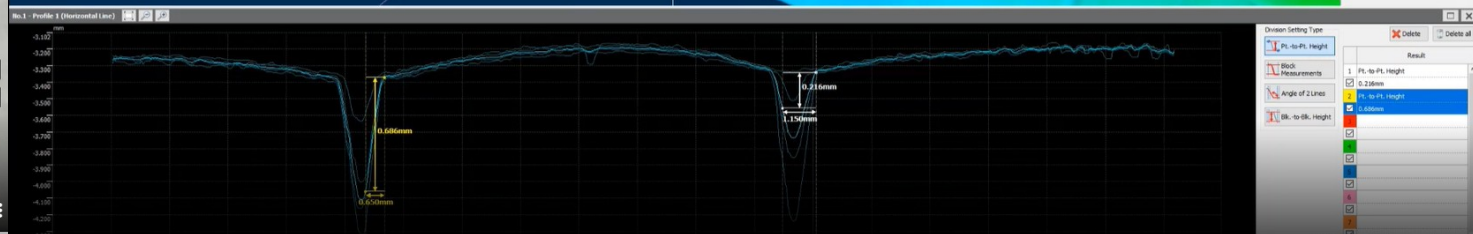
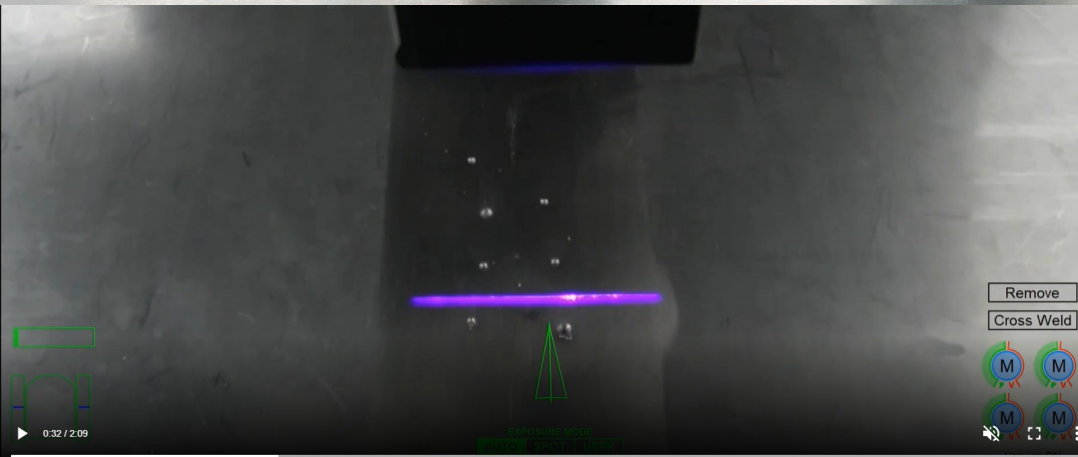
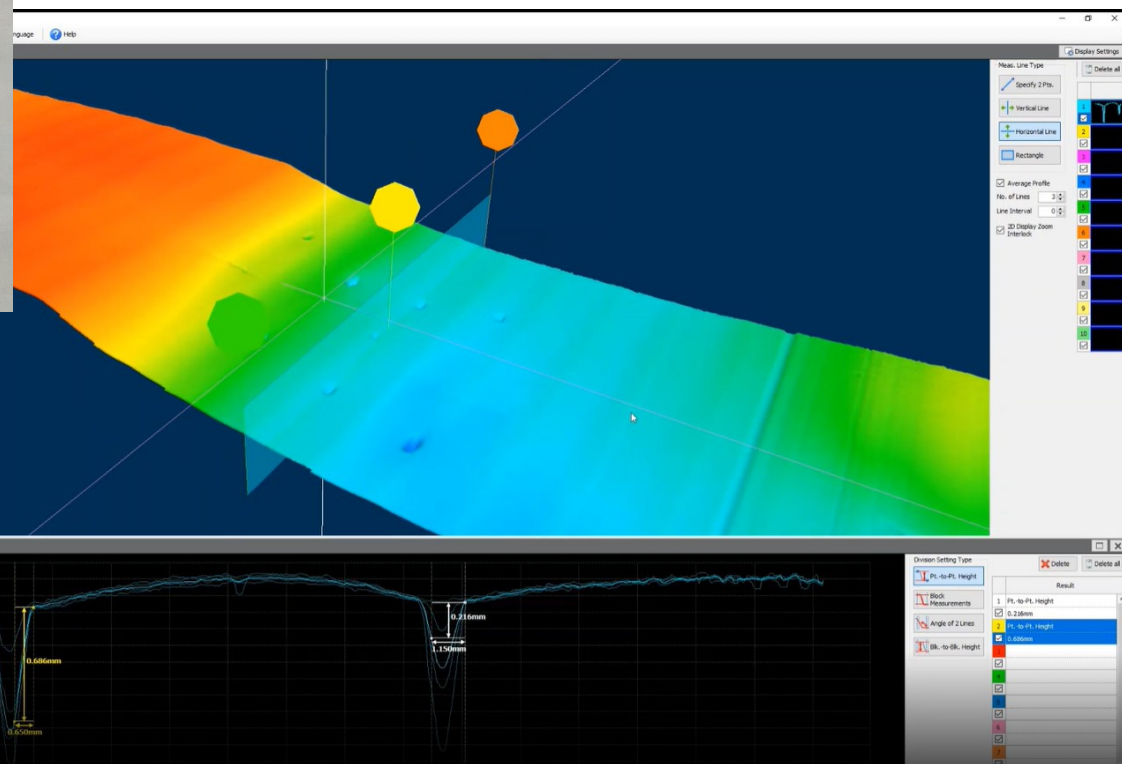
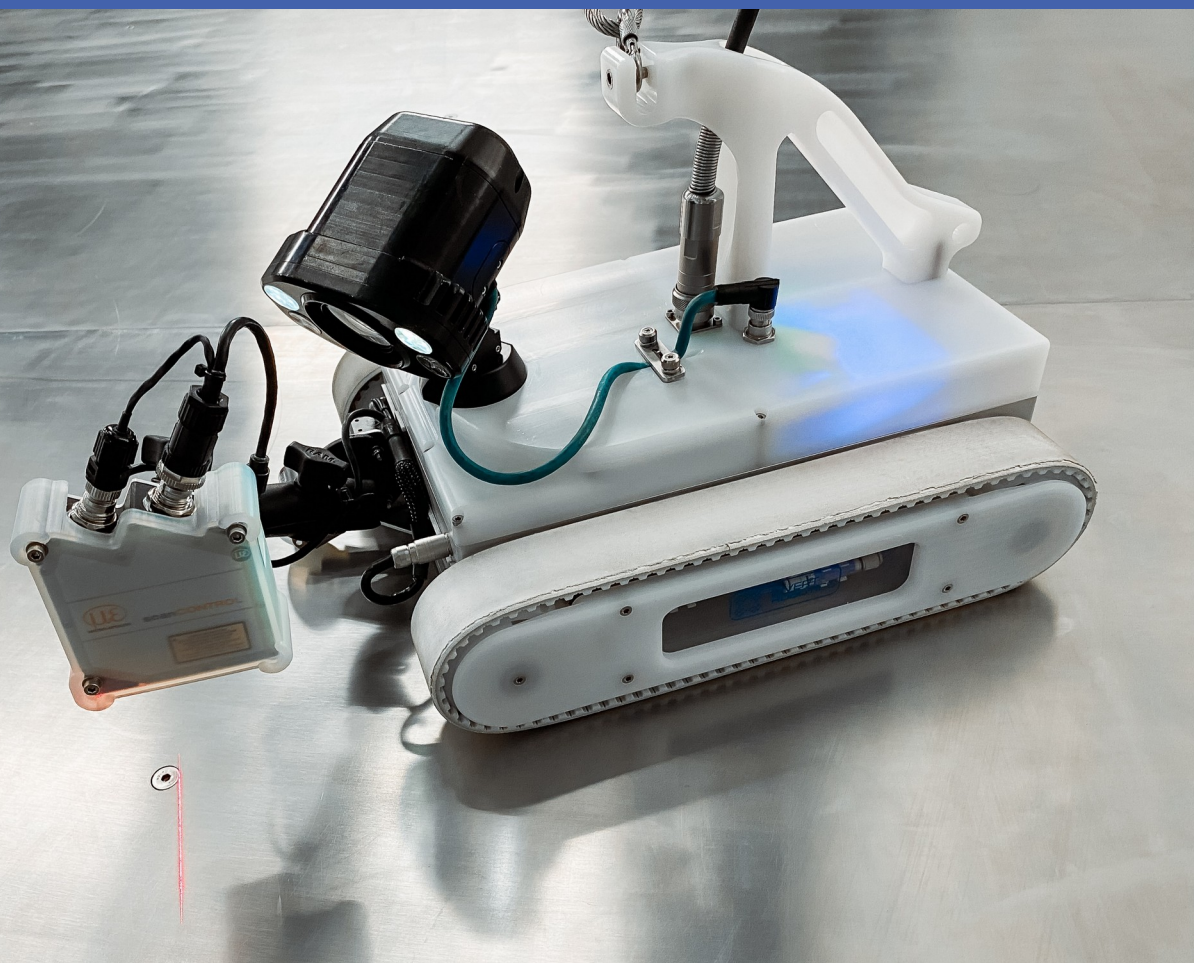
Basic Guided Workflow

Left button: rotate | Left + Right buttons: spin | Middle button: pan | Middle click: set rotation center | Mouse wheel: zoom | Shift + Middle button: zoom on region | Hold Ctrl: start selection





2D/3D HD Laser Scanning





Universal Payload Bay

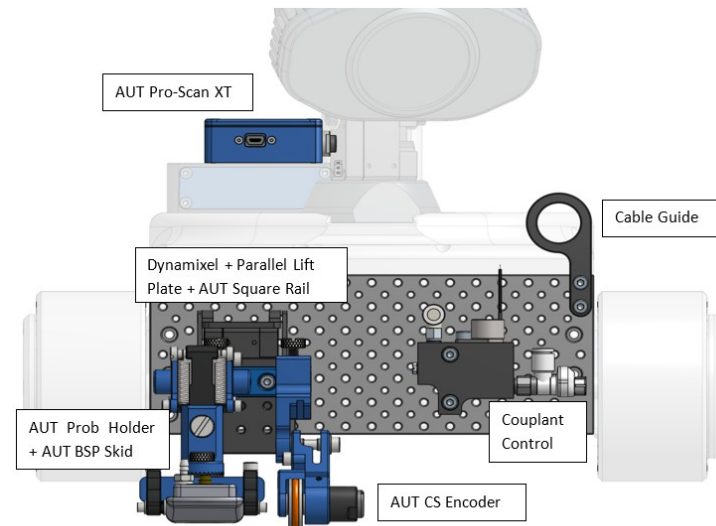


Figure 3-1: Components required for B-scan UT testing

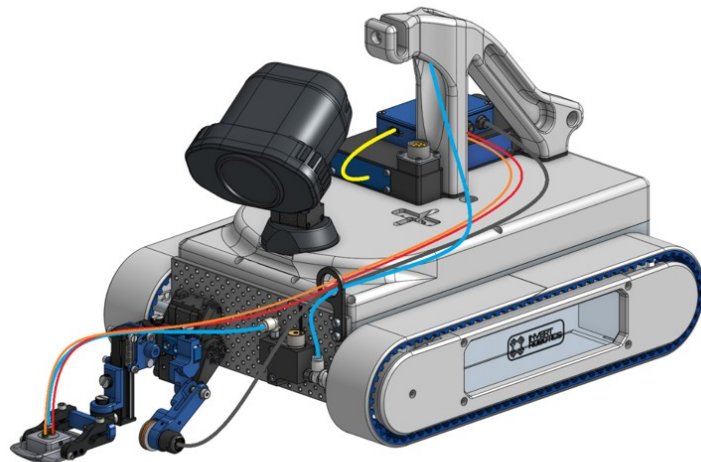


Figure 3-2: Cable and hose paths for B-scan UT testing

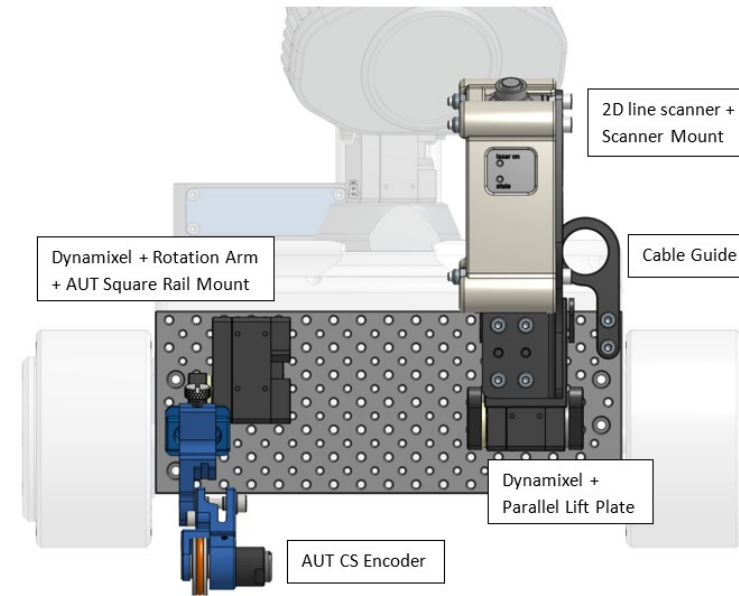
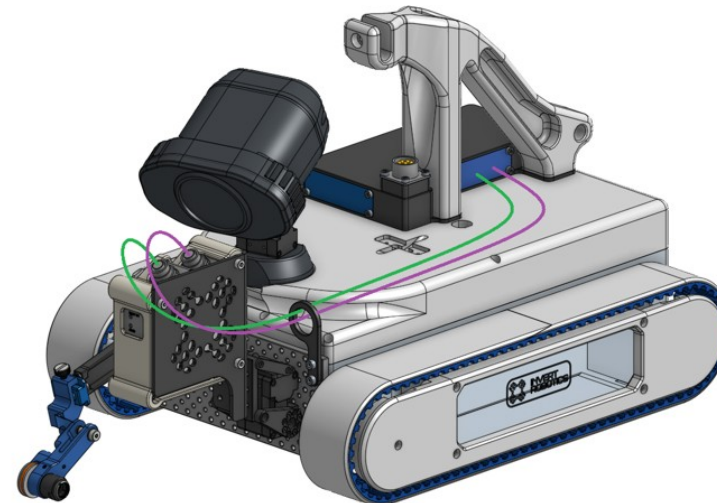


Figure 4-1: Components required for 2D Line scanner use.





Turbine Blade Inspection





Turbine Blade Inspection





Thank you!

**Any
Questions?**

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