

ROBOTICS

Robotic 3D inspection system

Warranty in metrology, revolution in production



- The turnkey Robotic 3D inspection system is the ultimate answer for industries looking for a fast ROI while reaching 100% quality control with a productivity ramp up, and operative costs reduction.

ABB's robotic 3D inspection system

Be one click away from 100% quality control automation

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- 01 Tolerance color maps
- 02 Customizable reports
- 03 Reference points control
- 04 2D sections

A new generation of measuring cells

ABB's 3D Robotic Inspection System is a new generation of standardized measuring cells, which are designed to deliver cost-effective, state-of-the-art robotic 3D inspection operations. All cells deliver maximum performance whilst making optimum use of available space. Every stage in the product production (prototype / preproduction / ramp up / mass production) has its measurement needs. ABB has developed solutions for your needs.

The cells are equipped with centralized power distribution. All components such as robot, positioners, 3D scanning equipment, CAD comparison computer and other peripheral devices are supplied from one source; this means that one power supply cable is necessary for the whole cell.

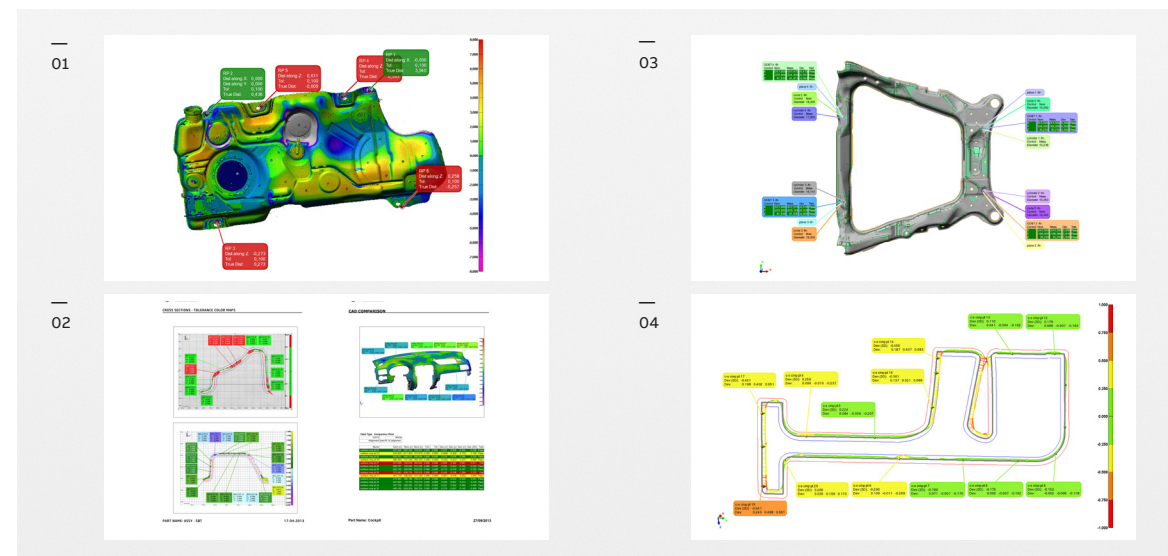
Be one click away from automated quality control

- Plug & Play" system – easy automated inspection to simplify operation for production employees

- "Shop floor" inspection – to provide rapid feedback about production process variation, for improved process control and scrap reduction
- Cost reduction – reduction of the faulty parts replacement while value is added by the capacity of ensuring 100% quality
- Competitiveness increase – time saving on inspection process execution and big savings based on the reduction of revision campaigns
- Compliance with the International Standards - VDI/VDE certification Part 2&3

ABB's 3D Robotic Inspection System is the most effective solution in your industry

- General industry
- Automotive industry
 - Cross members, stamped parts, door module exhaust systems, brake components, car seats, wheels, axles, dashboards
- Aeronautical industry
 - Geometrical inspection of 100% parts



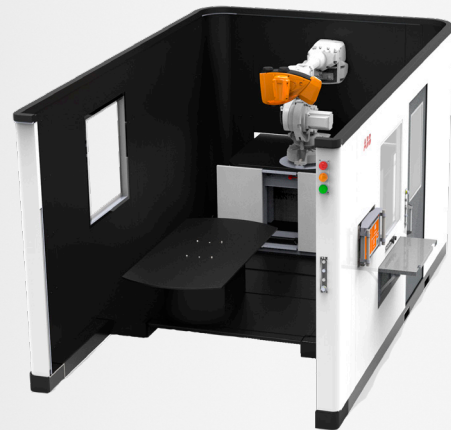
ENGINEERED SOLUTIONS

Manufacturers increasingly have to improve quality and productivity while accommodating greater product variation and customization in smaller lots. The 3D sensor technology rapidly records and compares highly detailed geometric and surface data with digital CAD models, enabling the automation of inspection of manufactured parts and pieces, helping factories to reduce cycle times while raising quality and reducing the risk of quality control errors.



Off-line quality inspection solutions

FlexInspect



The FlexInspect is the ABB standard cell for off-line quality inspection. Designed to deliver cost-effective, state-of-the-art robotic 3d measuring operations. A more dynamic technology than a traditional CMM (Coordinated Measuring Machine) and an evolution of 3D Laser technologies. Simple, Fast, Accurate, Easy to Use and Connected.

— The state-of-the-art 3D scanners are based on white light technology that provides high-definition detail of the surface of an object on a macroscopic to micrometer scale.

Main components

- IRB 4600 or IRB 6700 robot and IRC5 controller
- Sidio Airus (Off-Line 3D Scanner)
- Sidio Control Unit
- Sidio Planner (ABB RobotStudio)
- Auto calibration system
- VDI 2634/III certification
- PolyWorks Inspector software
- Cell control HMI
- ABB turning table
- Safety fence and cell safeties

Best fit for

- Shop-floor measurements
- Fast off-line measurements (10x faster than CMM)
- Complete part measurement (color map)
- As an optional: Reverse engineering, welding seam inspections, Spatter detections, Rivet detections
- Small, medium, and big parts measurements

Technical specifications

| | |
|-----------------------------------|---|
| Unit size and weight | Robotized unit: 1600 x 1300 mm – 800 kg With rotary table: 3000 x 1300 mm – 1000 kg With closure: 4830 x 2900mm – 3000 kg |
| Max. part size specifications | Cylinder of 2000 mm diameter and 2000 mm height |
| Field of view | From 340 x 215 x 200 mm ³ to 550 x 390 x 200 mm ³ |
| Cameras | 1.4 Mpxls / 5 Mpxls 3D sensor camera; Photogrammetry camera: 7 m + 7 m/m |
| Accuracy | From 18 μm |
| Repeatability | 20 μm |
| Speed | Up to 0.25 sec/shot |
| Operating conditions | Temperature: 5 – 45° Light: Designed to work regardless of light conditions, in ambient industrial conditions Electrical compatibility: 200 V – 600 V 50 Hz / 60 Hz III Phase |
| Rotary table (up to 600 KG parts) | Includes flexible holding fixtures for supporting multiple parts types |
| Floor mounting or fixing | Anchors for floor fixing |
| Certification | Compliant to VDI 2634/II , VDI 2634/III and CE |
| Closure | Includes emergency stop button, safety sensors and fencing. Entry: 2500 mm width with photoelectric sensors Maintenance door |



In-line quality inspection solutions

InspectPack

The InspectPack is a new generation of In-Line quality control solutions from ABB. An evolution of 3D Laser technologies. Simple, Fast, Accurate, Easy to Use and Connected.

— By scanning with white light, the scanners can detect imperfections in a product and also create a draft 3D mesh of the object for reiteration in CAD. This 3D mesh may also be used for reverse engineering.

Main components

- ABB robot and IRC5 robot controller
 - ABB IRB 2600ID robot
- Sidio Lite (In-Line 3D Scanner)
- Sidio Control Unit
- Cell HMI
- Calibration system
- VDI 2634/II certification
- PolyWorks inspector software (Innovmetric)

Best fit for

- High Speed In-Line measurements
- Critical geometrical features
- As an option for: Welding seam quality inspections, spatter detections, rivet detections

Technical specifications

| | |
|----------------------|--|
| Field of view | 340 x 215 x 200 mm ³ |
| Camera | • 1.5 Mpxls 3D optical scanner (3000 ANSI lumens) • White light/Blue light technology |
| Accuracy | From 18 μm |
| Repeatability | From 20 μm |
| Speed | • Up to 0.25 sec/shot • 30s: medium part size / 15 geometrical features and 5 welding seams measurements |
| Operating conditions | • Temperature: 5 – 45°. • Light: Designed to work regardless of light conditions, in ambient industrial conditions. • Electrical compatibility: 200 V – 600 V 50 Hz / 60 Hz III Phase. |
| Certification | Compliant to VDI 2634/II and CE Declaration of Incorporation |

Robotic 3D inspection

Key benefits

Single camera technology

One camera system reduces the number of views overlapping and potential hardware failures

White/Blue light technology

Great and adjustable light power to get the best digitizing results regardless of light conditions

Shiny/Black parts digitization

EDR technology implemented system parameters adjustment to easily digitize shiny and black parts without the need for spray

Extremely fast

The XR technology and seamless integration with the ABB robot allow the scanning process to be done within the fastest time while the measured data is processed in real time using multiprocessor technology

High flexibility

Combined with flexible holding fixtures, the simulator based on RobotStudio® allows easy configuration of new parts using only CAD data and an inspection plan

Fast learning curve

Quick customization and very easy to use solution. No specific skills are required. Two training days are enough to handle and control the full operation of the cell

Touch screen control

Designed to allow the operator to have a hand in the process thanks to the friendly user interface and intuitive process

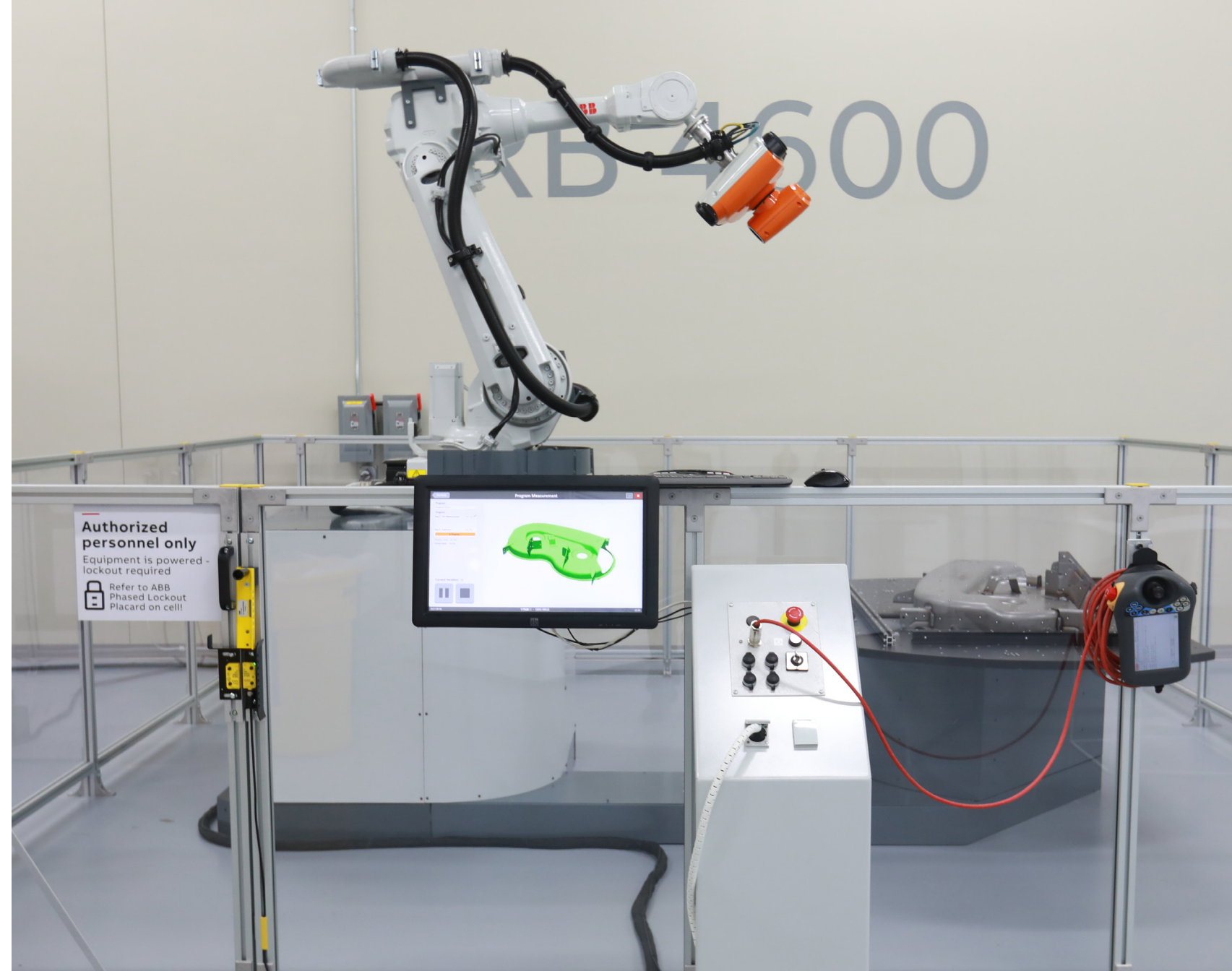
Remote control assistance

Unit fully integrated with the ABB Patented Remote Service for retrieval of the system performance data. The root cause is immediately diagnosed and identified to determine how performance issues can be resolved

Connected for a smart future

In a Smart Factory, data from 3D scanners is stored in a collective Cloud – a wireless and internet based archive of information. Storing information in this way enhances connectivity across all areas of a business, and makes the information readily accessible when required.

As customers' automation processes become more advanced and production cycles shorten, the ability to efficiently automate quality inspections becomes a compelling competitive advantage.



Robotic 3D inspection system

Software

Combining robotics and software is pivotal in implementing digitalization and expanding ABB Ability™ as a key driver of our Next Level strategy.

Sidio Airus Software:

The core and main processor of the ABB 3D scanner. White light patterns creation, signal treatment and point cloud processing algorithms.

PolyWorks Inspector:

The cloud of point is passed to PolyWorks to build the metrology report according to the customer requirements.

RobotStudio® Sidio planner:

A plug-in used to generate the path of the robot and program parts in an off-line computer. Sidio Planner is an off-line programming software based on ABB RobotStudio add-in, fitted for:

- Design measuring trajectories of the robot
- Offline simulation and online adjustments
- Support for PolyWorks in virtual environment



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