Klas Bengtsson, October 2013

Integrated Vision

Introduction

There are endless applications in which a Vision Guided Robot can add flexibility, reduce hard automation cost at the same time meeting high quality standards and safety guide lines. The only question is if it can be done in a cost effective and reliable way?

ABB Integrated Vision does not compromise anything. The most advanced vision tools needed are now an integral part of ABB robots and with minimum experience or programming time perform a variety of applications that work 24-7.

Introduction
ABB Smart Camera

Compatable to Cognex In-sight series

Integrated Lightning

75x55x47 mm

IP 67

800x600 or 1280x1024 resolution

4 different lenses

Autofocus optics

Ethernet, power and I/O via industrial M12 connectors

Targeted Applications
Find It, Check It, Trace It

Find it

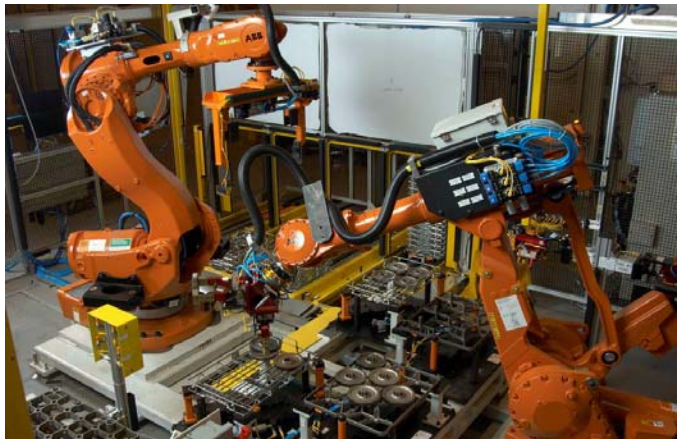
Check it

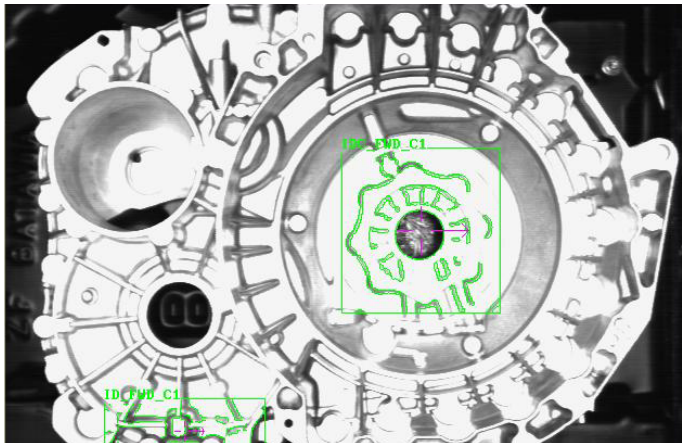
Trace it

Targeted Applications
Find It

- Vision guided robots find items without costly hardware arrangements

Targeted Applications
Check It





- Inspection of parts before passing on to next production step
  - Classification of defect types
  - Tools for measuring surface defects
  - Verify tolerances

Targeted Applications
Trace It

- Reading and verification of1D/2D barcodes
- Text reading and verification
- OCR/OCV reading

How It Works
Hardware Setup

PC

Used for setup and programming via RobotStudio. Can be removed during production

FlexPendant

Monitoring and simple maintenance

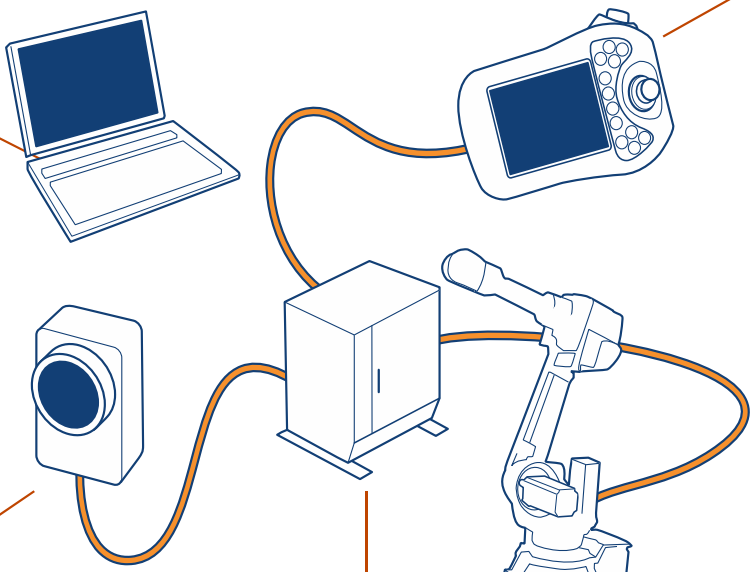


ABB Smart Camera

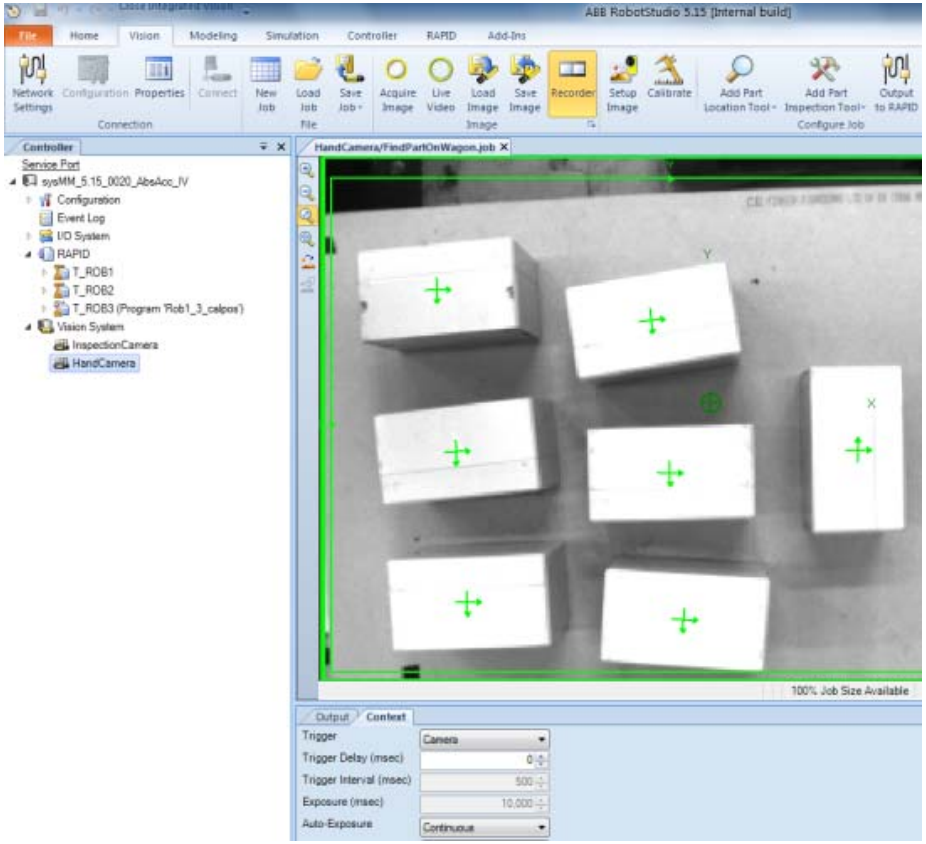
Smart camera with embedded image processing

Cognex In-sight compatible

IRC5

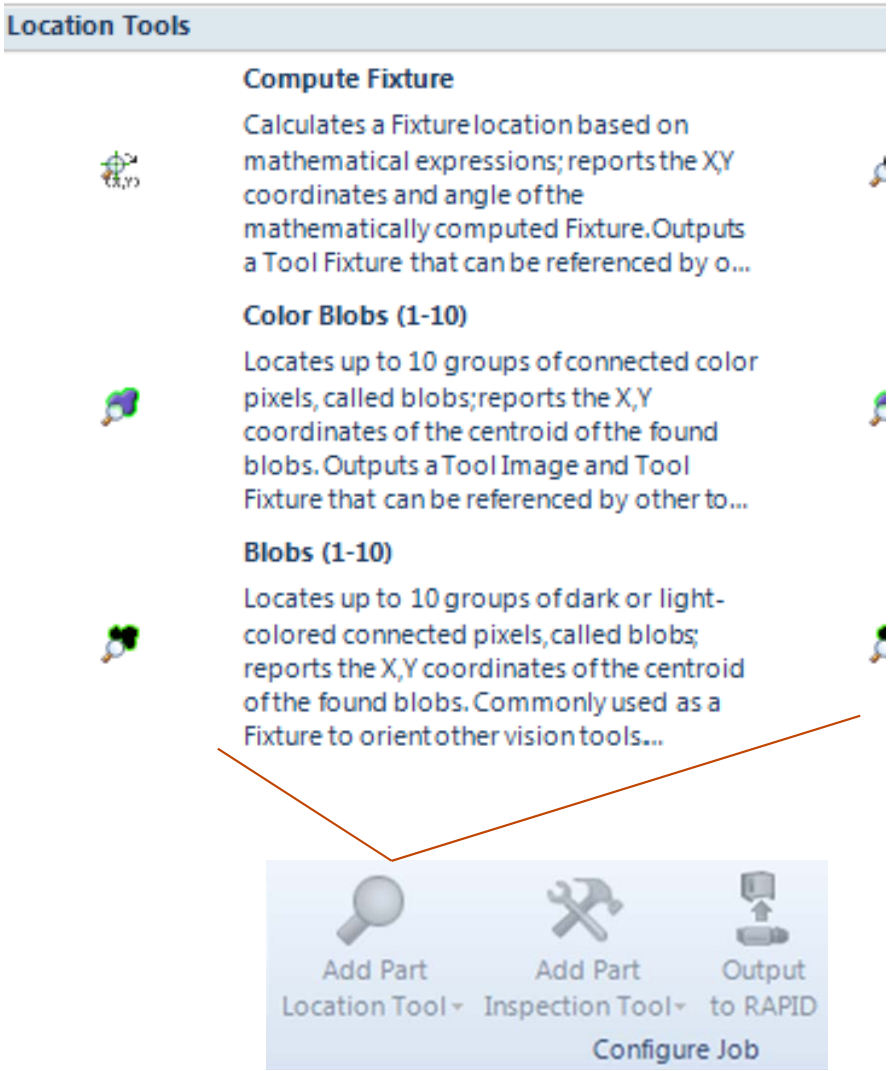
Camera discovery, standard Rapid instructions, communication runtime including result queues.

How It Works
Programmed in RobotStudio



- Both robot and camera are programmed in RobotStudio
- Camera an integral part of the system
- Easy to understand “How To” programming tabs in RobotStudio
- Program sent to controller via Ethernet but is NOT needed in runtime

How It Works
> 50 Task Oriented Vision Tools



- Select from > 50 task oriented vision tools from a list
- Comprehensive decription of ”How To Use” pop up when a tool is chosen

How it works
Simple Rapid Programming

```
12      PROC Run()
13          VAR CameraTarget camTgt;
14
15          !Load the camera job
16          CamLoadJob myCamera, "FindTheBox.job" \Flush;
17          CamStartJob myCamera;
18
19          !Move to the photo position (if the camera is handheld)
20          MoveL pPhoto, v1000, fine, tool0 \WObj:=wobjCamera;
21
22          !Take photo and get result
23          CamReqImage myCamera;
24          CamGetResult myCamera, camtgt;
25
26          !Approach vision target
27          wobjCamera.oframe := camtgt.cframe;
28          MoveL pPickTarget, v100, fine, tool0 \WObj:=wobjCamera;
29      ENDPROC
```

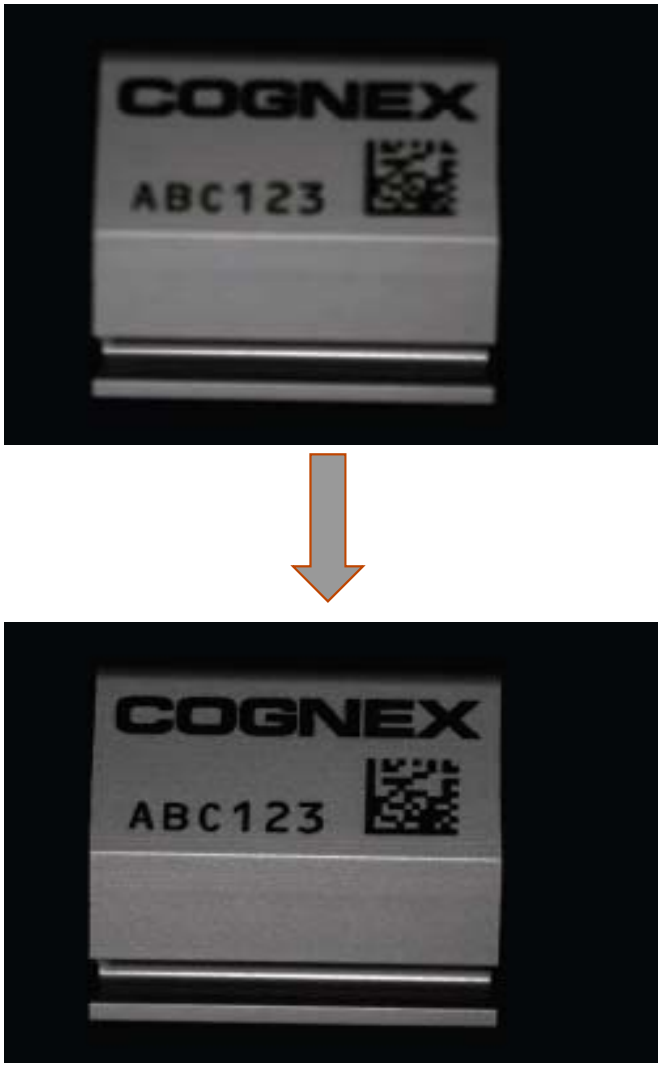
- Basic camera commands written in RAPID are available in a Library
- Complete tasks ready to be used in Snippets

Key Values
Scalability

- No need for a PC or a special CPU inside robot controller to run the vision cameras
- Each camera has its own CPU so there is enough capacity to handle whatever number of cameras - calable

No need to worry about PC requirements

Key Values
Auto Focus



- The built in Auto-focus simplifies the use in cells where parts with different heights are handled
- Ideal in areas where the camera is hard to reach

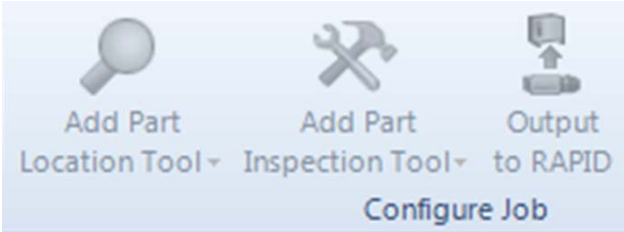
Key Values
Built in Lighting

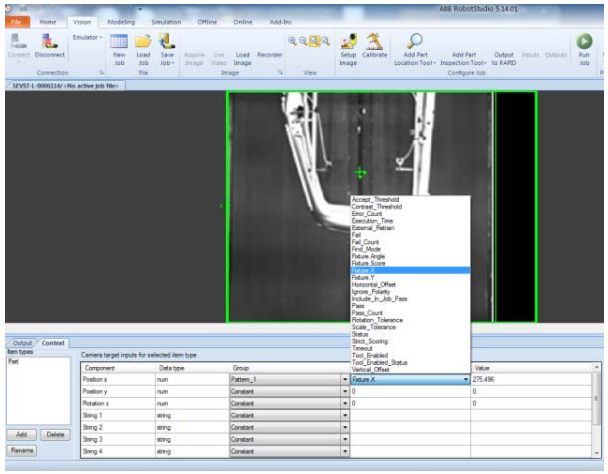
- The built-in lights
  - Provides basic front lightning for standard applications
- Allows user to start using the camera without a separate lightning system

Key Values
In-Sight Compatible

- Any Cognex In-Sight camera automatically plugs into the ABB Integrated Vision system
- 6 different color cameras
- Up to 2448x2048 resolution
- IP68 Stainless steel
- 43 different models

Key Values
Simplicity of Installation, Calibration and Programming





Integrated generic vision tool for all purpose applications

- Minimum installation time
  - Pre-configured and simple to calibrate
- One-stop-shop
  - Smart camera, power and cables, SW
- Cuts programming time
  - Vision and programming in one common tool (RobotStudio)

Key Values
Cutting Edge Vision Technology

- The ABB Integrated Vision, powered by the Cognex, is a state-of-the-art vision system designed to work on the manufacturing floor under the most challenging of conditions
- The vision system is intuitive and easy to work with, automatically selects features and proposes parameters, minimizing deployment
- The result is very reliable even in the most challenging vision application

Key Values
Small, Rugged and Precise

- 75 x 55 x47 mm small, the ABB Integrated Vision camera is easy to squeeze in wherever it is needed
- The housing withstands caustic environments and has an IP 67 protection to work in tough environments
- High resolution 1280X1024
- Medium resolution 800X600

Key Customer Values
Summary

Time saving	Intuitive	Reliable

More Vision Guided Robotics applications can be deployed faster by more people and with greater reliability using ABB Integrated Vision

Power and productivity
for a better world™