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Cognex Vision System

Demo Guide

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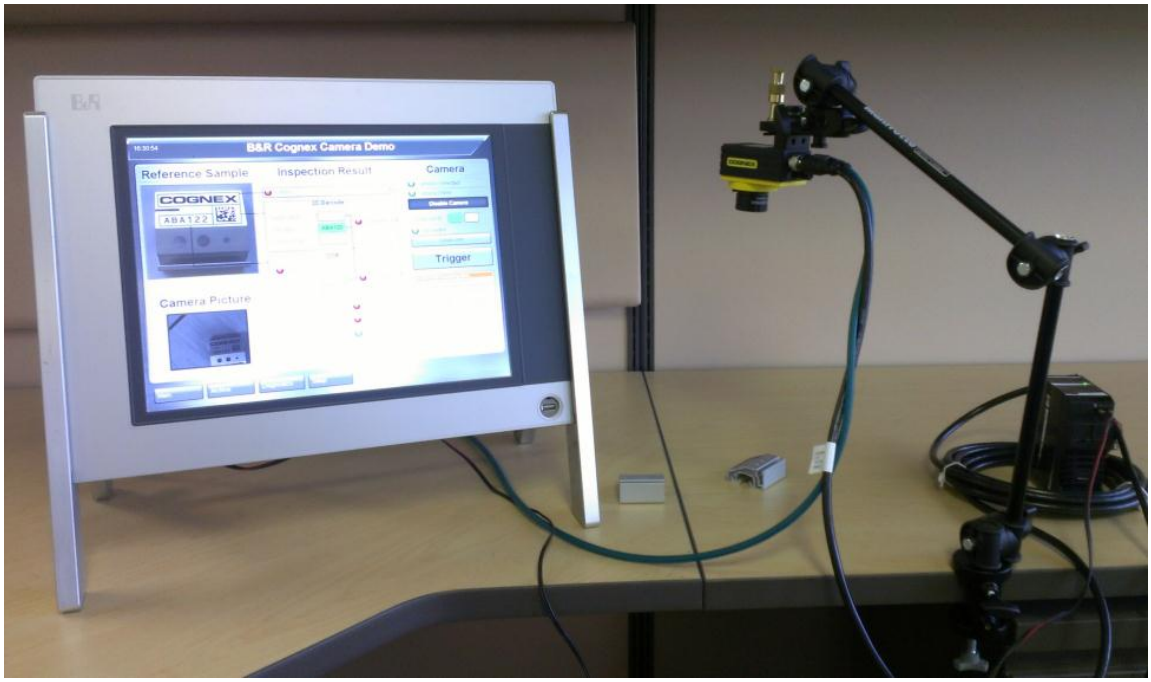
Revision: 1.2

1 Demo B&R hardware

1.1 Hardware assembling

PP500 15” + Powerlink interface
Compact flash card 128MB or bigger
Cognex Camera with Powerlink interface
Power supply, cables, stand

Assemble the hardware as shown on the picture on the below.



Connect the Powerlink cable to Ethernet slot as shown the picture below.

The distance between the camera lens and the table should be 11” (28cm). This is about the length of standard US paper sheet.

Place the sample on the table so that text on the sample is in line with label on the back of the camera.

Hint: Make sure that you have good illumination on the sample. Increase illumination if the camera does not detect any information.

The lens has aperture and focus to adjust the picture. Looking from the top (Viewpoint) of the camera **gently** rotate the upper ring (Aperture) clockwise to the limit. The small white point should point at 1.8. If the picture is too bright rotate the aperture counter clockwise until the image has the correct brightness.

Move the lower ring (Focus) counter clockwise to the limit. If the distance was measure correct the image should be sharp.

Hint: Never force the lens rings to rotate. If the rings do not move make sure that the small screws on the ring are not tight.

1.2 Show HMI without display

When using the demo with a headless device (ex X20CPU) you have to use VNC to access the HMI.

VNC Server
IP address: 192.168.0.10
Password: w

1.3 Demo functions

The demo shows the integration of the Cognex camera system into the B&R World over Powerlink. The demo includes two sample parts for inspection. Cognex supports a large variety of functions to inspect parts and we are demonstrating only two simple functions in this demo. The camera has a job stored for each hardware sample.

Sample Job 1 (for demo part with additional holes)
Read 2D bar code and compare it with a string coming from the B&R PLC system. Read text and compare it with 2D barcode.

Sample Job 2 (for demo part without additional holes)
Read text and compare it with 2D barcode.

The jobs can be loaded from the HMI (see next page).

1.3.1 Main screen

The main page is used to operate the camera and show the inspection results.

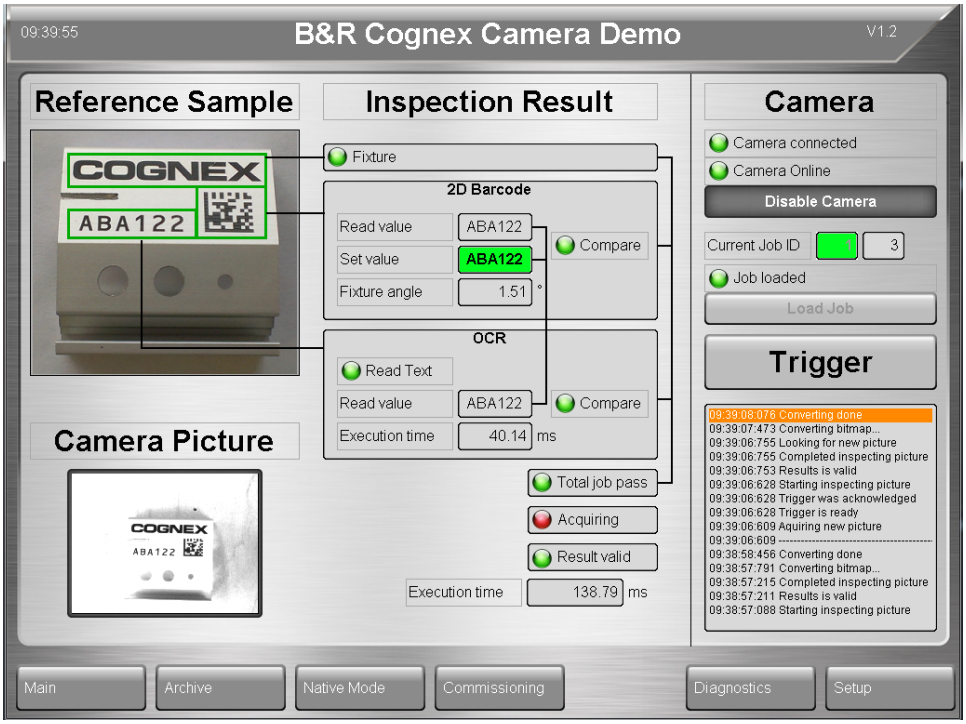
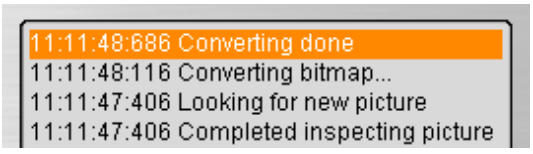


Figure 1 Main page

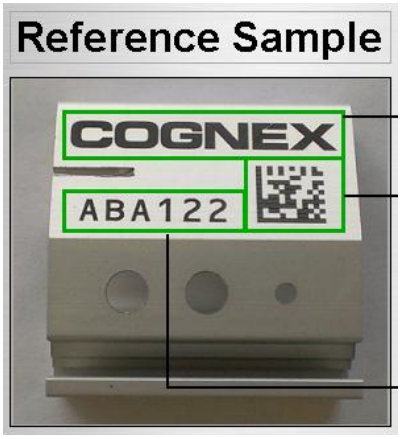
If the camera is connected correct the two led's on top right shout be green. When the system is powered up it can take up to minute before the camera goes online.

The camera has two jobs stored and will automatically load job 1 on boot up. To load a new job "disable camera" first. Enter the new job number (1 or 2) into the green box. The green led indicated the job was loaded successful.

This button will trigger a new image.



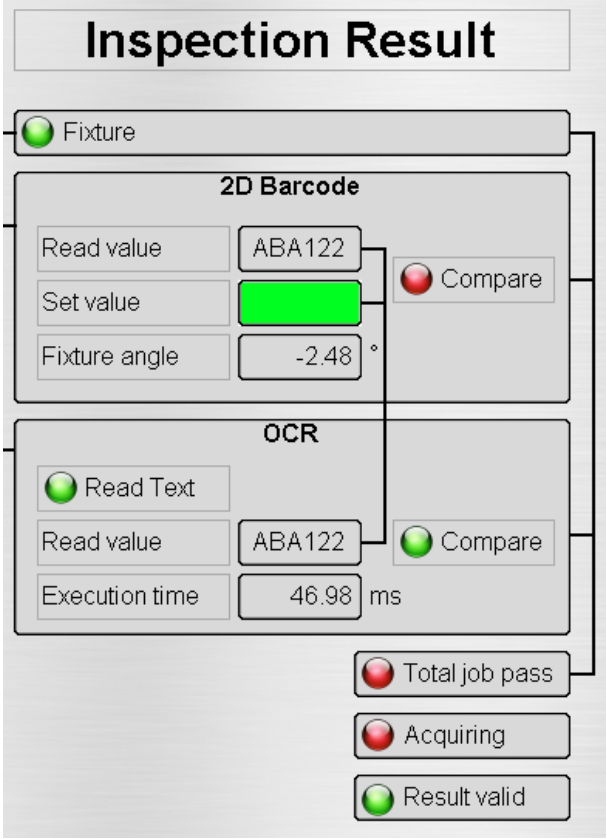
The logger will show relevant events during capturing and analysis of the picture.



The reference sample is just static picture that shows what information's are inspected.

Whenever the camera takes a picture it will upload the picture via FTP onto the PLC. The PLC will detect the new picture and display the image below the reference sample. The image is send in quarter size to save bandwidth on the Powerlink network.

The inspection result data is coming directly from Powerlink bus. See 1.3 for details of the different jobs and how to load them.



First the camera has to identify and locate the position and angle of the sample. The camera is configured for allow a 15 degree angle. If the part is rotated more than that the camera will not be able find a fix point.

When the camera identified the part it will read the 2D bar code. When job 1 was loaded the camera will also compare the value with a string coming from the PLC. If this was successful the LED will become green. Beside this comparison the camera can provide a lot of additional information. For this demo we chose to add the Fixture angle.

The second step is an OCR function where the camera reads a text pattern from the sample part. This text has to match the 2D barcode. In addition we will display the execution time for the OCR function.

The camera provides a flag that indicates if all tasks passed successful.

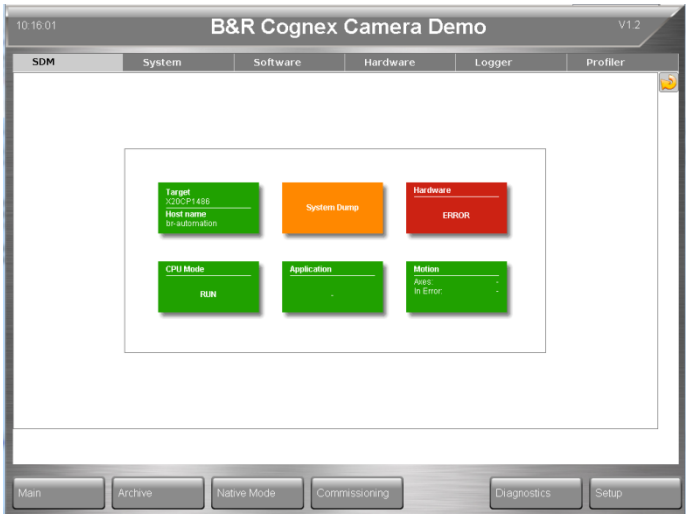
While the camera is inspecting the part this LED will become green. When the inspection is done the result valid will indicate if the inspection was successful.

1.3.2 Archive Screen

The archive screen shows pictures that are stored on the flash card. The demo will store the last 20 pictures and automatically delete the oldest picture when 20 pictures are exceeded.

1.3.3 Diagnostics Screen

The diagnostics screen shows the SDM interface.



1.3.4 Setup Screen

The setup screen shows information like IP address. You can also calibrate the touch and change the brightsness.

1.3.5 Native Mode over Powerlink

The camera has a telnet interface that provides access to large variety of functions. The PLC can access this telnet interface through a library over Powerlink or Ethernet. This screen only shows a few sample commands. Cognex calls this interface Native Mode. A list of all possible commands is available in the InSight Explore help file.

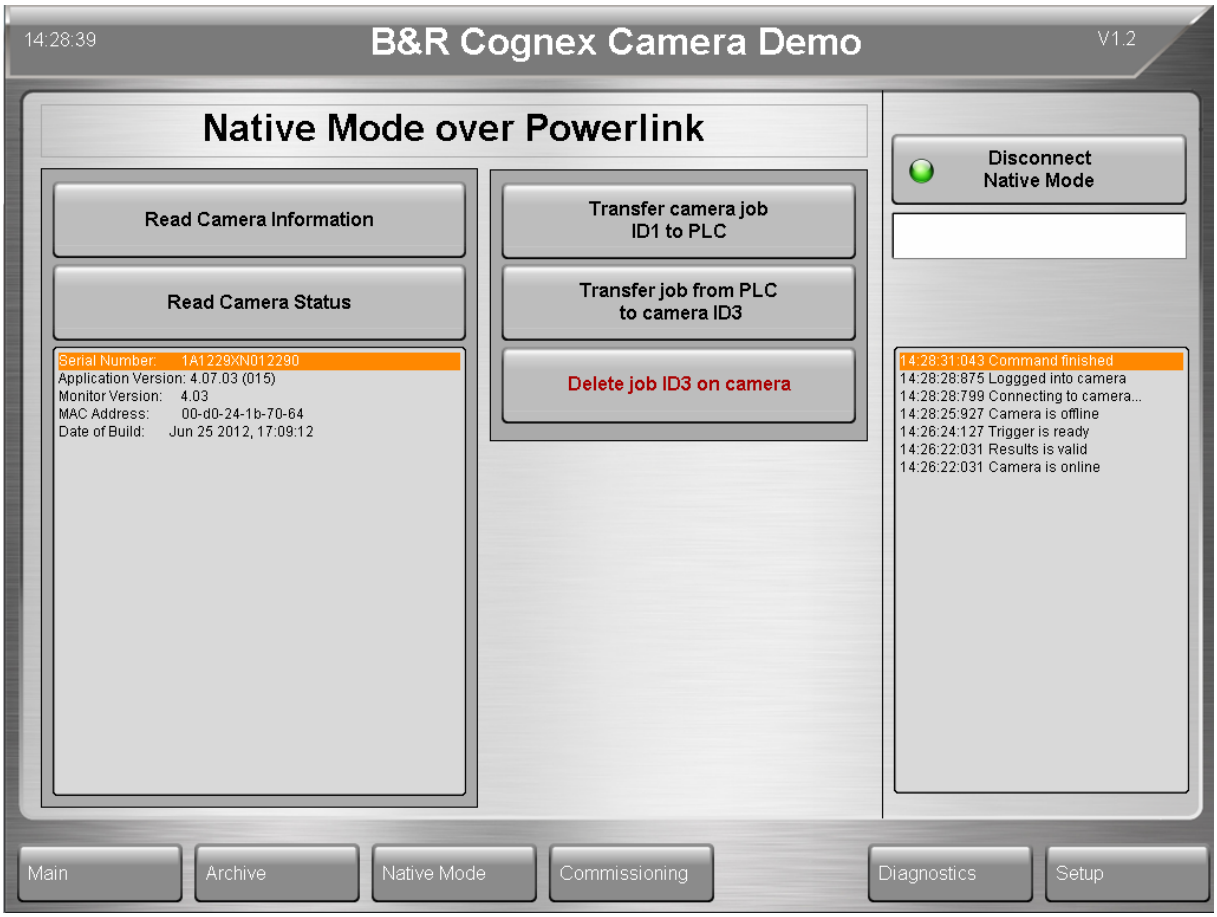


Figure 2 Native Mode page

The native mode library supports simple commands like “Read Camera Information” or “Read camera status”. These commands typical respond with a small amount of data that can be processed in one step. The library also supports file transfer from and to the camera. This function can be used to transfer new jobs to camera directly from the PLC without an additional PC system. The customer can store jobs on a USB stick and transfer them directly to camera trough the PLC.
Jobs are stored on the camera in slots called IDs. In this sample we can load the job from ID1 to the PLC. The job will be saved in the folder “cognex_files” which can be accessed via FTP. The first job can also be transferred to camera into ID3. After a successful transfer the job can be loaded on the Main page. The job in ID3 can also be deleted from the camera.

Hint: The camera needs a few seconds after the transfer to store the job. Wait at least 5 seconds between transfer and delete.

1.3.6 Native Mode over Ethernet

This mode works exactly like “Native Mode over Powerlink”. The idea behind this mode is to commission a camera that is not configured for Powerlink yet. Connect the camera to the PLC standard Ethernet port.

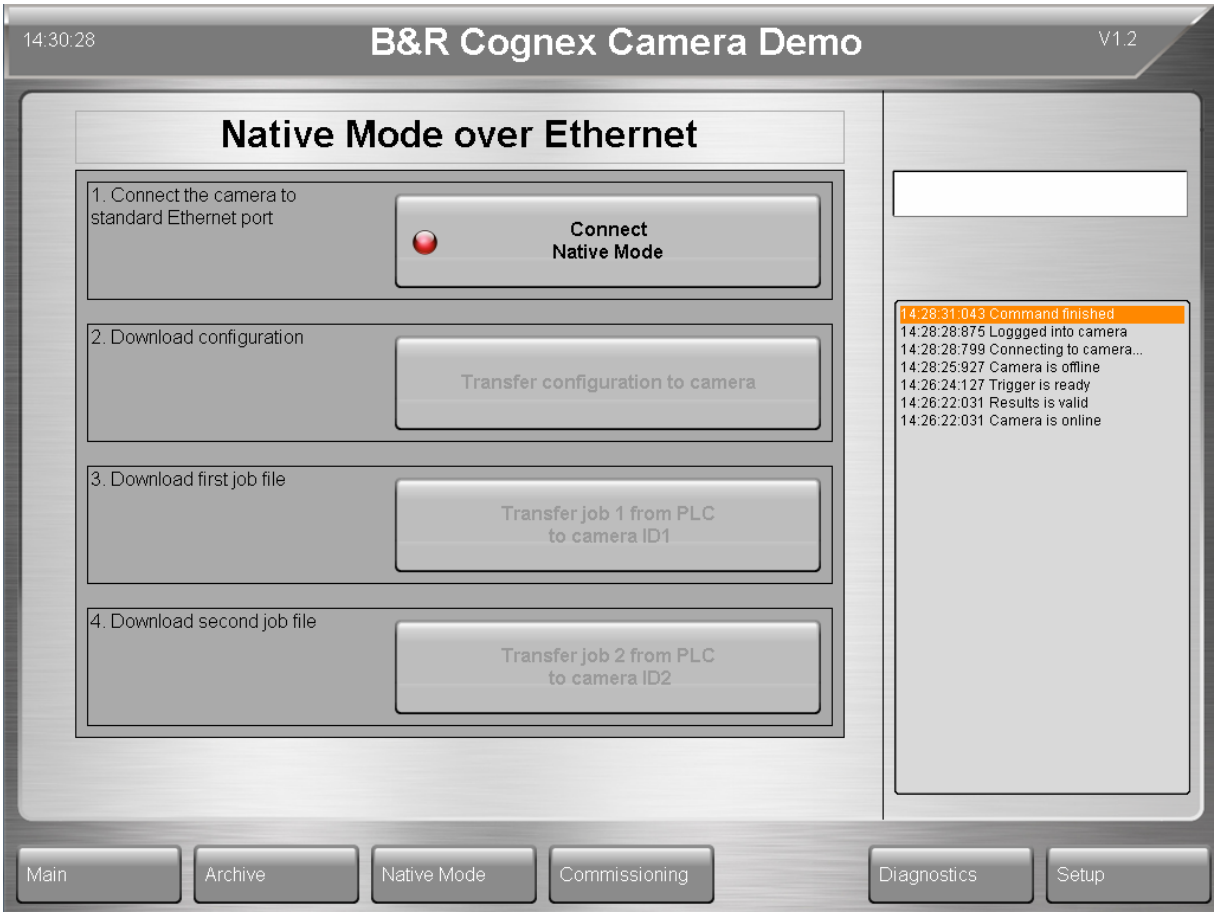


Figure 3 Commissioning a new camera

The PLC uses a DHCP server that assigns an IP address to the Cognex camera. You can then connect to the camera telnet interface and download the configuration and job files. Now the camera can be connected to the Powerlink network.

2 Packing up the demo

It is very important to wrap everything up correct before shipping it back to Atlanta. Roll the camera into the cushion film and put it into the small box with sample parts.

Make sure that the display is covered with bubble warp from **all** sides. If the display is exposed to storm case wall on only one side the display will get damaged!

Put everything back into the storm case as shown on the picture below.