

Getting started with the ST vision system

Hardware Installation

System components:

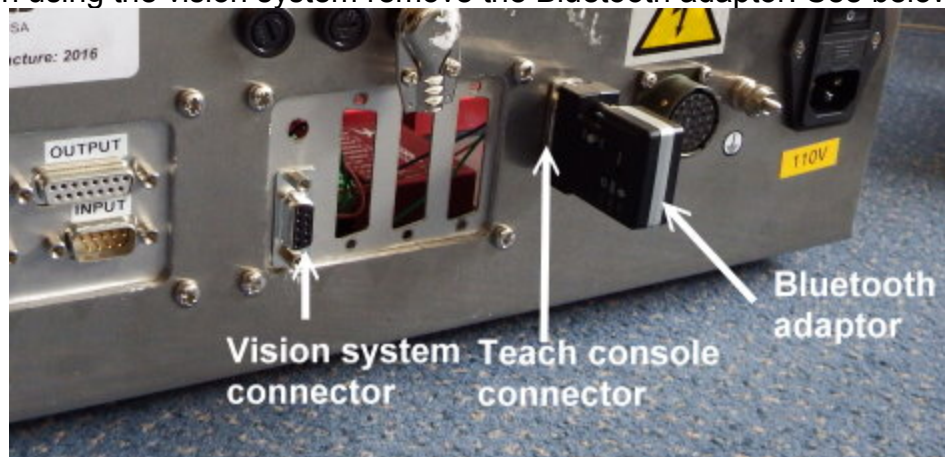
- Camera
- Camera power adaptor
- Vision system card (PCI – requires a PC)
- CAT5 cable
- 2 USB adaptors
- Second serial port internal cable with HE-14 6 way and 9-w D-sub connector (unless already fitted).

Install sequence:

- Install Vision system card into pc
- Install second serial port into controller as per instructions at the end of this manual (unless already fitted).
- Connect CAT 5 cable to card in PC
- Connect second usb adapter to pc. linking with pc cable after connecting to rear of controller with adapter
- Connect CAT 5 cable to vision system camera
- Connect power adapter to camera
- Boot up PC

IMPORTANT

The robot controller has 2 serial ports, port 0 and port 1. Port 0 is for communication with RobWin or any supervisor that will send commands to the robot. Port 1 is shared by the vision system and the Bluetooth teach console. When using the teach console disconnect the vision system. When using the vision system remove the Bluetooth adaptor. See below.



Software Installation

RobWin

First off get RobWin working:

1. Double-click RobWin7.msi to install if not already installed.
2. Connect a supplied USB converter to the front serial port (serial port 0) of the controller using a USB converter and the 9/25 adaptor.
3. Check that it is not using COM3. If it is use the device manager to change it (see below).
4. Go to control panel, system, hardware, device manager, ports. You will see USB serial port - note the port COM number. RobWin will only work up to com9 so if your converter has been mapped to higher than com9 then double-click that port, then go to settings, advanced. You will see COM Port Number click the drop-down. You might see a lot of COM ports marked "in use". It's usually incorrect unless in use by bluetooth. Pick the next available com (after bluetooth) up to 9 as indicated in the device manager but not com3. It may say it's in use do you want to continue, click Yes.
Whatever com number you choose, make a note.
5. Run RobWin and click comms, configure and use that com number.

Second serial port for vision communication:

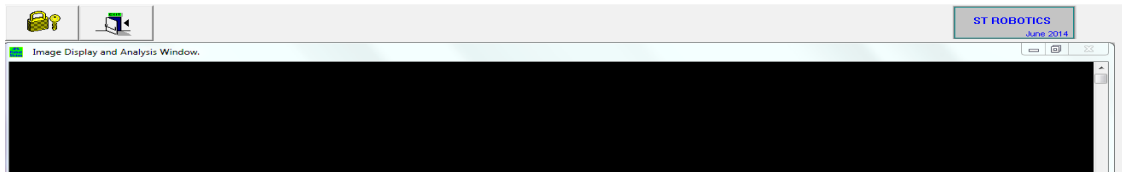
Connect the second USB converter to the controller rear 9 way connector for the controller's second serial port (serial port 1).

6. Go to control panel, system, hardware, device manager, ports. You will see a new USB serial port - note the port COM number. Double-click that port, then go to settings, advanced. You will see COM Port Number click the drop-down. You might see a lot of COM ports marked "in use". It's usually incorrect unless in use by bluetooth. Pick com3 anyway. It may say it's in use do you want to continue, click Yes.

Install vision hardware.

7. Install the Matrox GigE software MIL64setup.exe (not the MSI) (CD1)
8. When you see a query on page memory enter 256.
9. Install Software and Drivers for Vision system from the supplied CD (2) and reboot
10. Run the Robot Vision software, robotvision.exe

Using the vision software.



Img1

11. Press Padlock button to unlock software(img1 on left)
12. Press the robot communication button (img2 center).
13. Check the following settings:



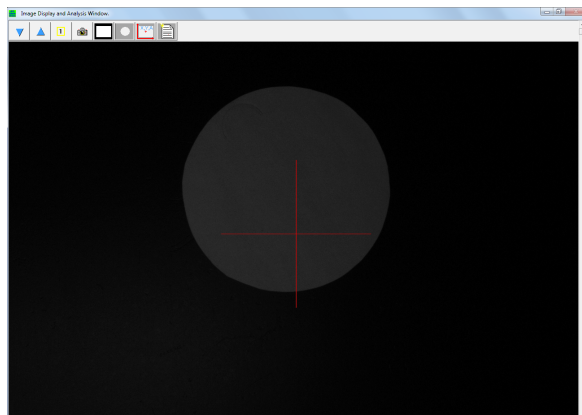
Img2

Baud Rate : 9600
Data Bits : 8
Parity : None
Stop Bits : 1

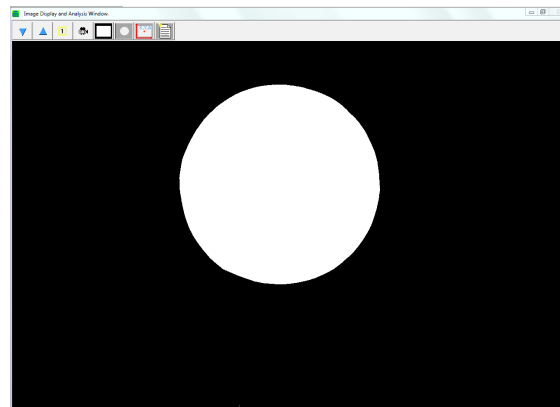
All Flow check boxes unselected.

14. Place the calibration disc under the camera.

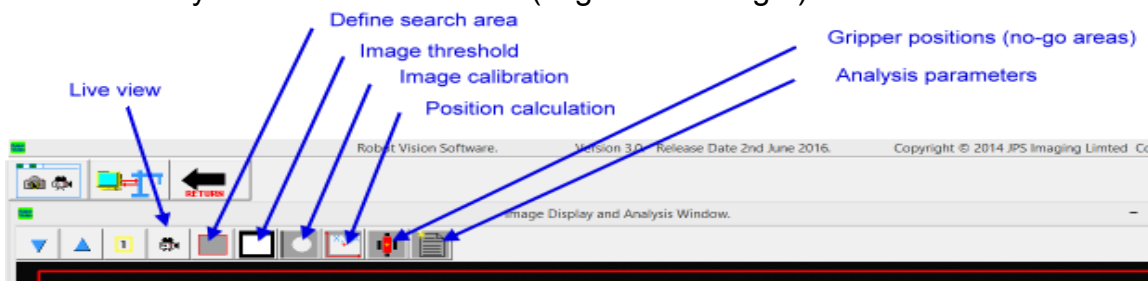
15. Press display and image analysis button. (img2 left). A still Image from camera should be displayed. If not, Please check the hardware is fully connected and there is no flashing red light on the camera. A reboot may be required.



Img3



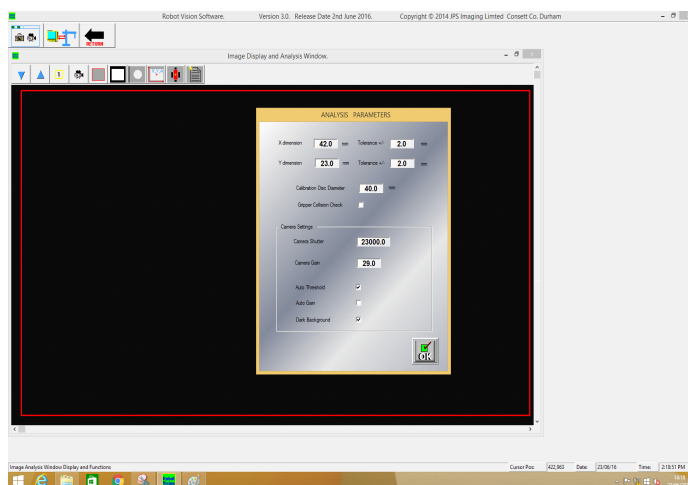
16. Press the Analysis Parameters Button (img4 furthest right).



Img4

17. Place the calibration disc (or any white disk of known dimensions) in the center of the field of view. Calibration Disc Diameter should read 40.0mm if using the supplied white calibration disc.

18. Adjust required X and Y dimensions to the size of the object you will be using.



img5

19. Enter tolerances you require or leave as default
 20. If you have a light object on a dark background check "dark background".
 21. press OK
 22. Press the Live view button (img4 camera icon)
 23. Ensure the calibration disc on surface below camera. Also ensure that light levels are at a constant while the vision system is in use. Moving shadows or sunlight should be avoided.
 24. Line up the calibration disc to be as close to the center of the crosshairs of the vision system. This is point 0,0 and will ensure more accurate results if calibrated correctly.
 25. Exit live view by pressing the Display and image analysis button.
 26. Adjust the focus and gain levels of the camera. The gain levels can be monitored with the Image threshold button (see img4) Try to have as few white "flecks" around the calibration disc as possible while still being able to clearly make out the disc as a solid shape.
 27. Press the Image calibration button (see img4)
 28. Change to Live View mode (camera icon) Place object to be measured under the camera. Exit with the display and image analysis button.
 29. Press position calculation button (see img4)
 30. In the Robot Vision software press the Return Button (black left-arrow in img4). The vision system will only measure and communicate when in the locked state.
- If an error is displayed, Check the camera can see the object, that the X and Y are correct in settings and the Gain and Focus are set correctly.

Controller Set up

31. Load Vision project file in Robwin.
32. Test with "VIS" to check communication between Controller and Robot vision.

When you send the command VIS the controller then waits for a reply from the vision system software. This is 3 numbers: X position, Y position and orientation to X axis. If the vision system does not respond the VIS command will retry with a message RETRYING. If this continues indefinitely press esc.

The Vision project software has no places or routes. It is just text. So you can cut and paste this text into your own project (ed2 window).

If you want to debug communication:

Close the vision system.

Run a second copy of RobWin.

Go to comms, configure. Choose the com port for that USB converter and set baud rate to 9600 (same as vision system).

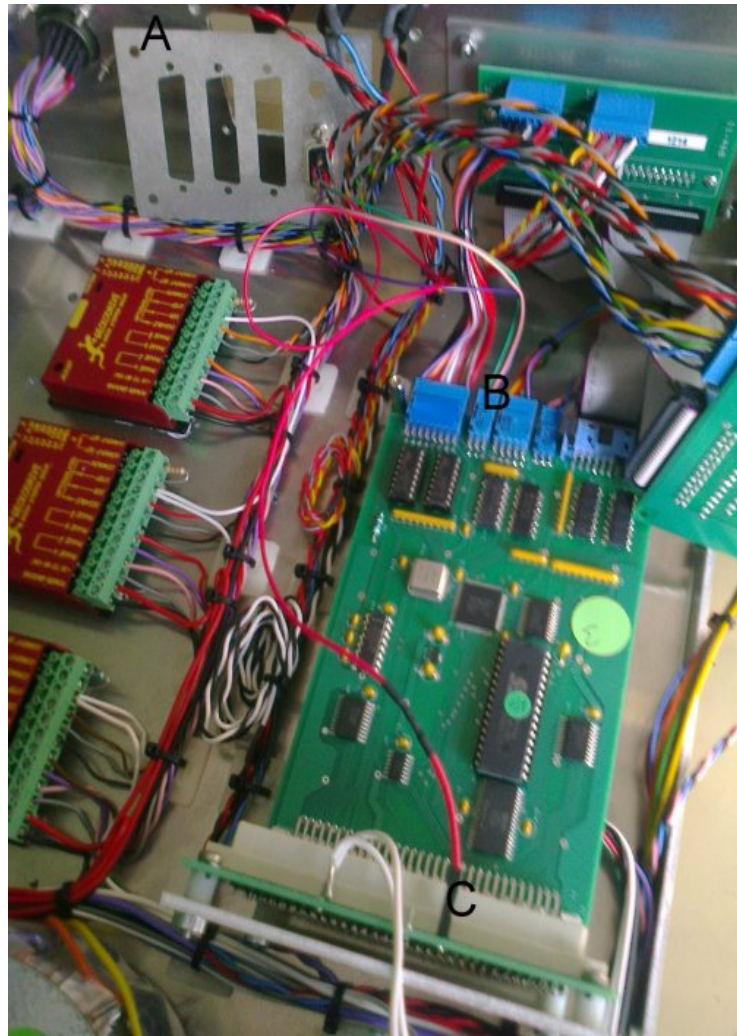
In the first RobWin enter HEX D0 1F JUMP to program the controller's second serial port.

Enter IOFLAG C1SET

Control will move to the second RobWin. Press enter in that window and see OK (crLf) >

Enter IOFLAG C0SET to switch back to first window.

Installation of the controller hardware:



- 1 Unscrew and temporarily remove the DSP card revealing the bottom card which is the CPU card.
- 2 Remove the rear blanking panel and fit the one supplied with a single 9-way connector as shown in A in above picture.
- 3 Plug the 3-wire blue connector into the empty socket on the CPU card at B
- 4 Refit the DSP card

Controller 2nd serial port pinouts.

9-W 'D' Plug	Name	6-W HE14
5	GND	6
3	TX	4
2	RX	2
9	+5V	+5V pin 'C'