

feedWare CX

Bildverarbeitungslösung für
alle anyfeed-Modelle .

basierend auf

Cognex In-Sight Kameras

flexfactory[®]
reinvent feeding

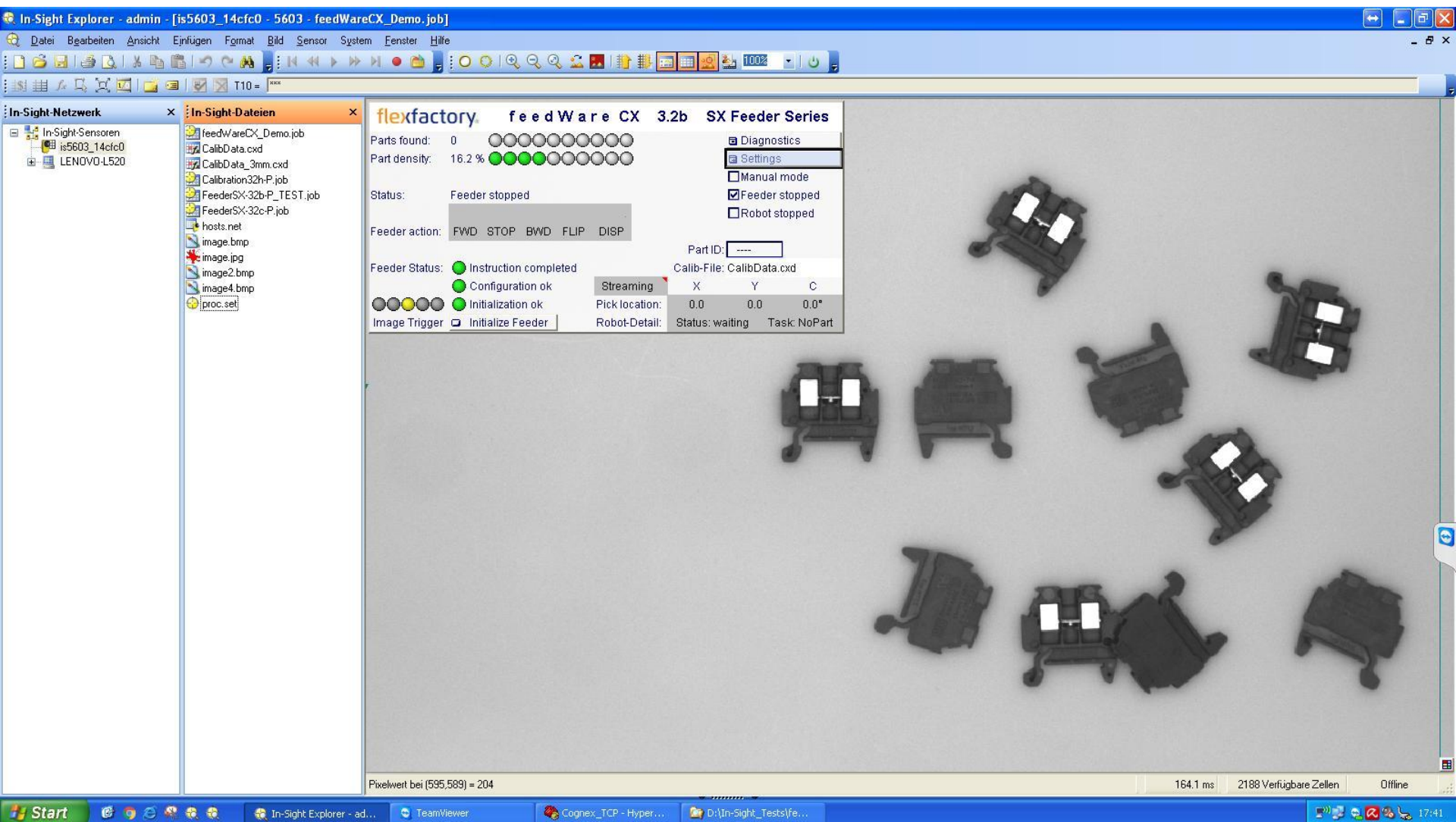
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Inhalt

Bilder zur Veranschaulichung der Bedienung

Die folgenden Screenshots zeigen Schritt für Schritt das typische Vorgehen zum Einrichten der Bildverarbeitung resp. dem Einlernen eines neues Teils mit unserer Software.

1. Bildaufnahme mit Referenzteil



2. Settings Auswahl: Preferences

The screenshot displays the In-Sight Explorer software interface. The main window shows a 3D model of a robotic feeder with several parts. The interface includes a left sidebar with file explorer, a top menu bar, and a central control panel. The control panel displays 'flexfactory feedWare CX 3.2b SX Feeder Series' and various status indicators. A red arrow labeled '1' points to the 'Settings' option in the 'Assistentenmenü' (Assistant Menu) dropdown. A second red arrow labeled '2' points to the 'Preferences' option within the 'Assistentenmenü' dropdown. The 'Assistentenmenü' dropdown is open, showing a list of options: Diagnostics, Preferences, Teach-in & Search-Settings, Sub-PatMax settings, Pick-Point Settings, Additional inspections, Feeder settings, Feeder motion-parameter, Graphics, and Robot calibration data. The 'Assistentenmenü' window has a 'Schließen' (Close) button at the bottom right. The Windows taskbar at the bottom shows the Start button and several open applications, including In-Sight Explorer, TeamViewer, Cognex_TCP - Hyper..., D:\In-Sight_Tests\fe..., feedWareCX_screens..., and Assistentenmenü. The system tray shows the time as 17:42.

3. Grundeinstellungen vornehmen

The screenshot displays the flexfactory feedWare CX software interface. The main window shows a camera view of a feeder with several black parts. A 'Preferences' dialog box is open, highlighting the 'Basic settings' section. The 'Basic settings' section includes:

- Exposure time: 10 [0.1 ms]
- Background: light colored
- Threshold for parts: 188 [0..255]
- PatMax search area: Set region
- In-Sight Model: 5000 series
- Gain: 100 (0..255)
- Part grayscale level (to distinguish between part and background)
- Limit pick area: Set pick area

The 'Feeding settings' section includes:

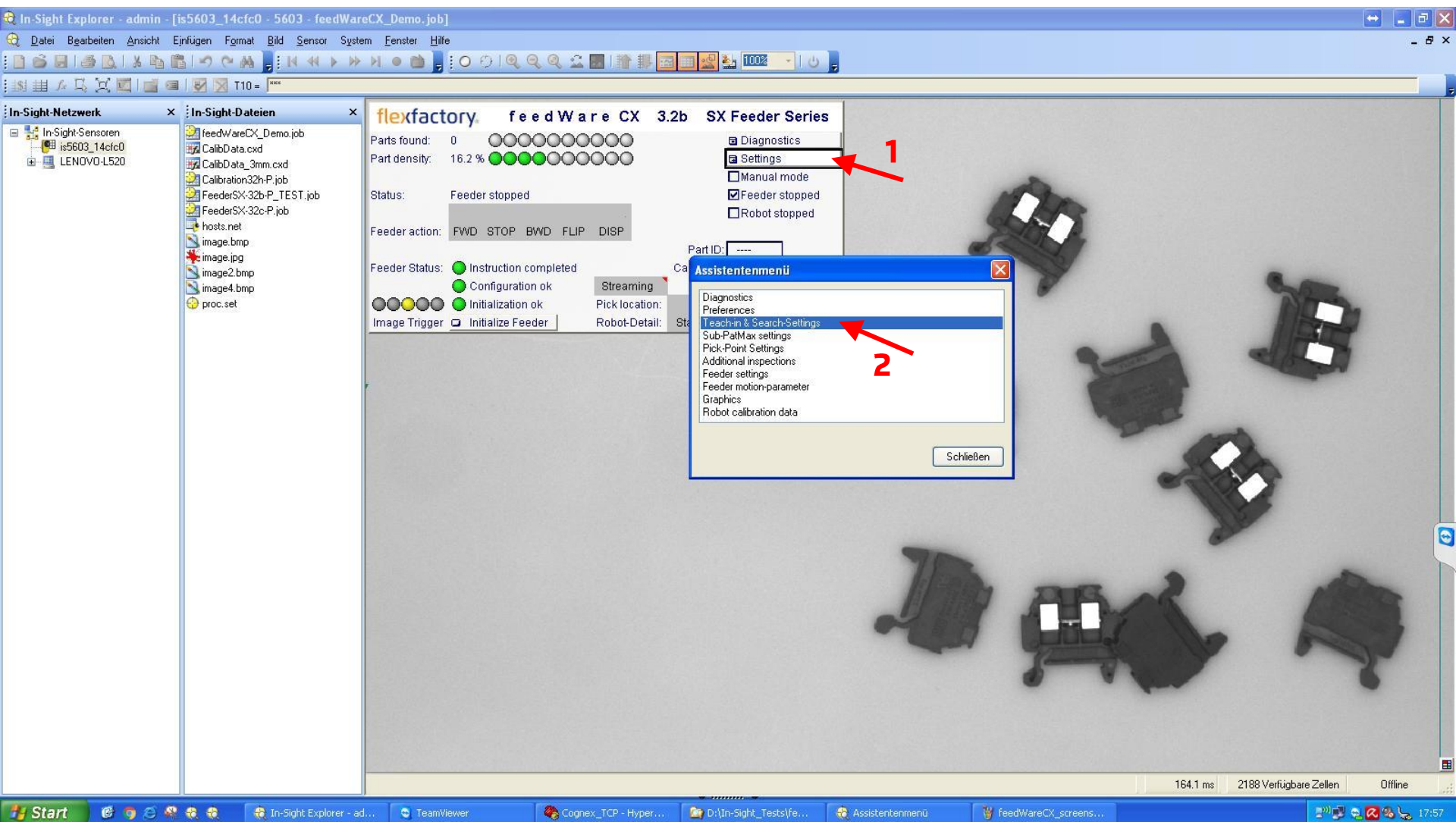
- Density area: Set region
- Upper limit: 30.0 [%]
- Lower limit: 12.0 [%]
- Dispense limit: 5.0 [%]
- Dispense after: 0 [FWD]
- Current coverage: 16.2 %
- Threshold for too many parts in FOV
- Threshold for too few parts in FOV
- Threshold for dispensing new parts
- Max. number of sequent unsuccessful FWD motions
- extra feeding rules:
 - FLIP instead of FWD if front-area is covered: Set front-area 10.0 [%] 47.8 %
 - Only allow dispense if drop-zone is free: Set drop-zone 10.0 [%] 54.4 %

The 'Motion-modes' section includes:

- Feeding-mode: forward with flip, backward with flip
- Flip Mode: always normal

The 'In-Sight-Dateien' panel on the left shows a list of files including CalibData.cxd, Calibration32h-P.job, FeederSX-32b-P_TEST.job, FeederSX-32c-P.job, hosts.net, image.bmp, image.jpg, image2.bmp, image4.bmp, and proc.set. The status bar at the bottom shows 'Pixelwert bei (896,745) = 206', '164.1 ms', '2188 Verfügbare Zellen', and 'Offline'.

4. Settings Auswahl: Teach-in



5. Menu zum Einlernen des Teils

In-Sight Explorer - admin - [is5603_14cfc0 - 5603 - feedWareCX_Demo.job]

flexfactory feedWare CX 3.2b SX Feeder Series

Parts found: 0
Part density: 16.2 %

Status: Feeder stopped

Feeder action:

Feeder Status:

Image Trigger

Teach-in & Search-Settings

Procedure to teach a new part

1. Place part in the centre of FOV
2. Switch offline (not required, but more stable condition)
3. Check "Teach-in active"
4. Set area around part or around feature to recognize
5. Set reference point (not necessary pick point)
6. Set symmetry
7. Set teach-in parameters
8. Uncheck "Teach-in active"
9. Set search parameters
10. Adjust offset for pick point (Menu - Pick Point settings)
11. Switch online

Teach-in active
 Set PatMax area
 Set reference point
360° (no symmetry)
Acceptance: 85.0 (%)

Search information

Max. Quality: 0.0 %
Min. Quality: 0.0 %
Last Search: 79.3 ms

Current mode: Search parts

Teach-in parameters
(Note: changes will only be applied when Teach-in active !!)

Elasticity: 0.0
Polarity: Ignore
PatMax-Mode: PatMax (recommended)
Granularity: actually: Fine: 1.0, Coarse: 5.0
1.4 3.5

Search parameters

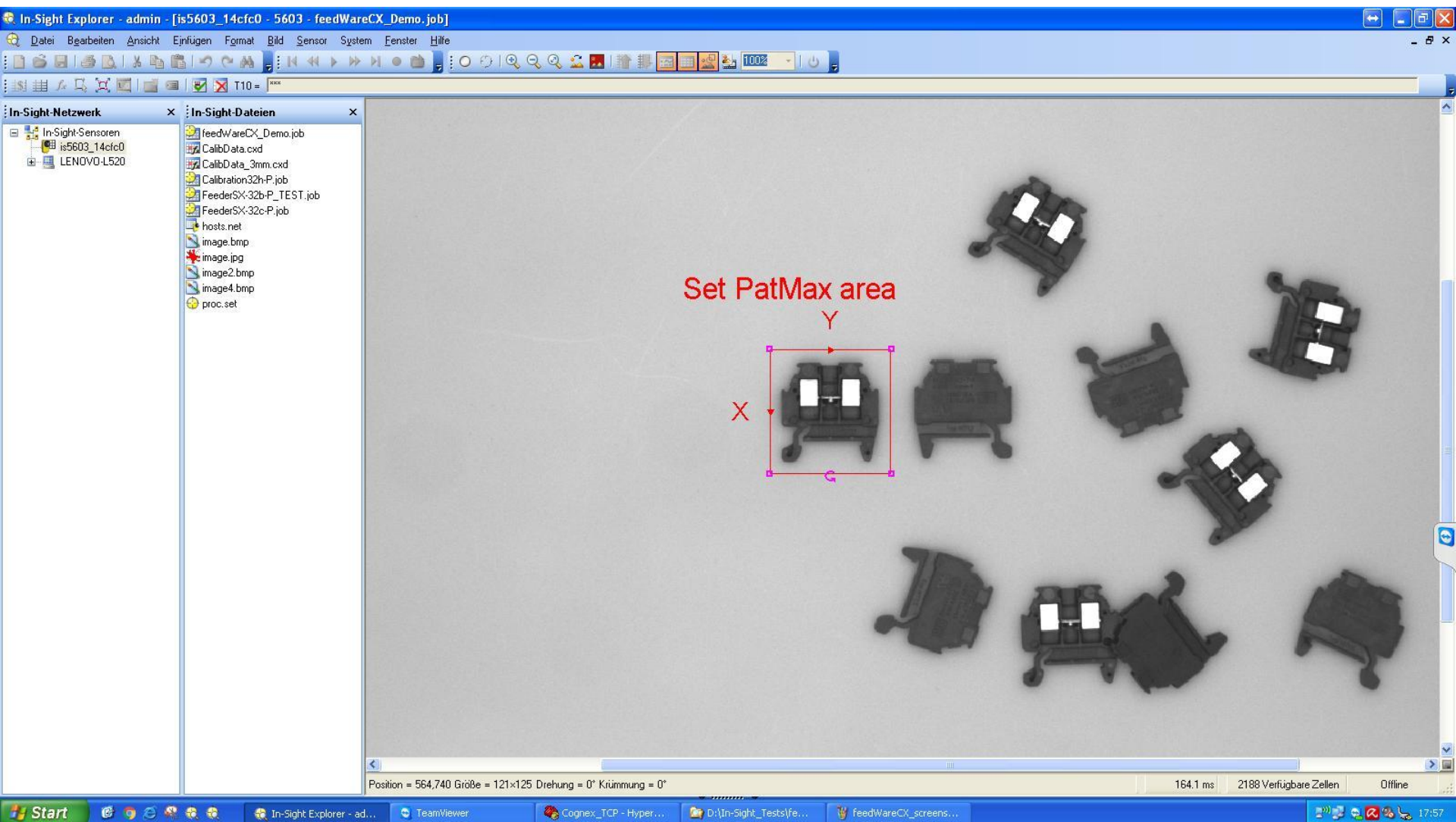
Look for X parts: 10
Mind clutter:
Min scaling: 100 [%]
Max scaling: 100 [%]
Overlap: 25
Show pattern:

Menü OK Abbrechen

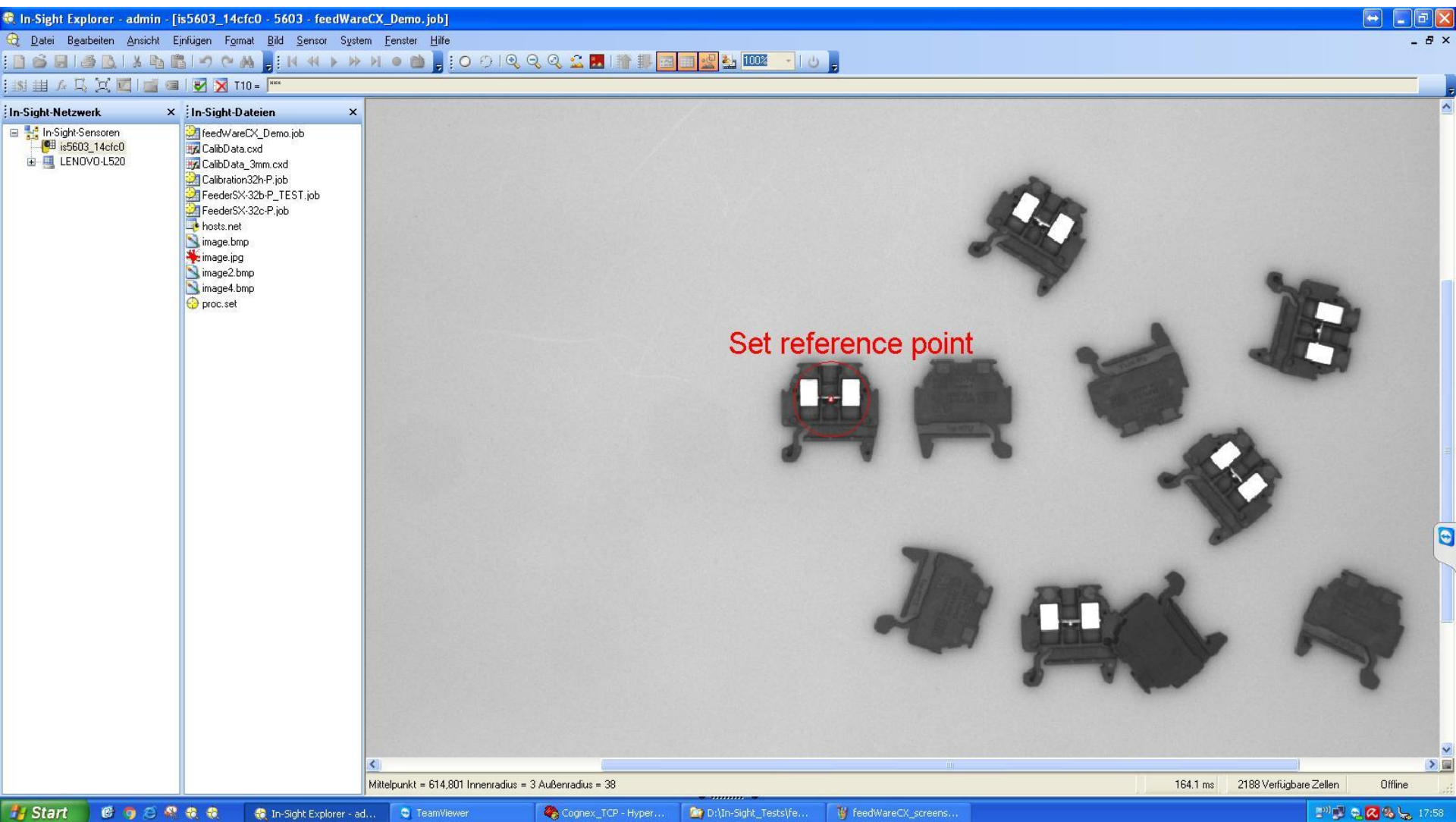
164.1 ms 2188 Verfügbare Zellen Offline

Start In-Sight Explorer - ad... TeamViewer Cognex_TCP - Hyper... D:\In-Sight_Tests\fe... feedWareCX_screens... 17:57

6. Region um Referenzteil legen



7. Referenzpunkt setzen



8. Teach-in ausführen

In-Sight Explorer - admin - [is5603_14cfc0 - 5603 - feedWareCX_Demo.job]

Datei Bearbeiten Ansicht Einfügen Format Bild Sensor System Fenster Hilfe

In-Sight-Netzwerk In-Sight-Dateien

flexfactory feedWare CX 3.2b SX Feeder Series

Parts found: 4
Part density: 16.2 %

Status: Feeder stopped
Teach-in active !!

Feeder action:
Feeder Status:

Image Trigger

Teach-in & Search-Settings

Procedure to teach a new part

1. Place part in the centre of FOV
2. Switch offline (not required, but more stable condition)
3. Check "Teach-in active"
4. Set area around part or around feature to recognize
5. Set reference point (not necessary pick point)
6. Set symmetry
7. Set teach-in parameters
8. Uncheck "Teach-in active"
9. Set search parameters
10. Adjust offset for pick point (Menu - Pick Point settings)
11. Switch online

Search information

Max. Quality: 100.0 %
Min. Quality: 99.9 %
Last Search: 130.9 ms

Teach-in parameters
(Note: changes will only be applied when Teach-in active !!)

Elasticity: 0.0
Polarity: Ignore
PatMax-Mode: PatMax (recommended)
Granularity: actually: Fine: 1.0, Coarse: 3.8
1.4 3.5

Search parameters

Look for X parts: 10
Mind clutter:
Min scaling: 100 [%]
Max scaling: 100 [%]
Overlap: 25
Show pattern:

Current mode: Teach-in active

Menü OK Abbrechen

164.1 ms 2188 Verfügbare Zellen Offline

Start In-Sight Explorer - ad... TeamViewer Cognex_TCP - Hyper... D:\In-Sight_Tests\fe... feedWareCX_screens... Teach-in & Search-Se... 18:00

9. Kontrolle der Erkennung

In-Sight Explorer - admin - [is5603_14cfc0 - 5603 - feedWareCX_Demo.job]

File Bearbeiten Ansicht Einfügen Format Bild Sensor System Fenster Hilfe

In-Sight-Netzwerk In-Sight-Dateien

flexfactory feedWare CX 3.2b SX Feeder Series

Parts found: 4
Part density: 16.2 %

Status: Feeder stopped

Feeder action: FWD STOP BWD FLIP DISP

Feeder Status:
● Instruction completed
● Configuration ok
● Initialization ok

Image Trigger: Initialize Feeder

Diagnostics Settings
 Manual mode
 Feeder stopped
 Robot stopped

Part ID: ----
Calib-File: CalibData.cxd

Streaming	X	Y	C
Pick location:	-245.9	372.4	360.0°
Robot-Detail:	Status: waiting	Task: Pick	

Pixelwert bei (774,834) = 202

164.1 ms 2188 Verfügbare Zellen Offline

Start In-Sight Explorer - ad... TeamViewer Cognex_TCP - Hyper... D:\In-Sight_Tests\fe... feedWareCX_screens... 18:01

10. Settings Auswahl: Pick-Point

The screenshot displays the In-Sight Explorer software interface. The main window shows a 3D model of a robot arm with several parts being processed. The interface includes a left sidebar with file explorer, a top status bar, and a central control panel. The control panel displays 'flexfactory feedWare CX 3.2b SX Feeder Series' and various status indicators. A 'Settings' menu is open, and a 'Pick-Point Settings' option is highlighted. Red arrows labeled '1' and '2' indicate the selection path.

1 Settings

2 Pick-Point Settings

Assistentenmenü

- Diagnostics
- Preferences
- Teach-in & Search-Settings
- Sub.PatMax settings
- Pick-Point Settings**
- Additional inspections
- Feeder settings
- Feeder motion-parameter
- Graphics
- Robot calibration data

Schließen

11. Pick-Point Menu

The screenshot displays the In-Sight Explorer software interface. The main window shows a top-down view of a robot arm with several black parts on a conveyor belt. A red box highlights one part, labeled "1st Picked Part". Green boxes with X and Y axes are overlaid on other parts, indicating their pick locations. The interface includes a menu bar, a toolbar, and a status bar at the bottom.

flexfactory feedWare CX 3.2b SX Feeder Series

Parts found: 4
Part density: 16.2 %

Status: Feeder stopped

Feeder action: FWD STOP BWD FLIP DISP

Feeder Status:
● Instruction completed
● Configuration ok
● Initialization ok

Image Trigger: Initialize Feeder

Part ID: ----
Calib-File: CalibData.cxd

	X	Y	C
Pick location:	-245.9	372.4	360.0°
Robot-Detail:	Status: waiting	Task: Pick	

Pick-Point Settings

Pick-Point Offset (relative to reference point)

X-Offset: 0.00 [mm]
Y-Offset: 0.00 [mm]
C-Offset (Angle): 0.00 [°] (-180°...+180°)

Source for X,Y,C: Use Main-PatMax as reference

Part-sorting method

Sorting method: Left to right Set Sort-Point

Multit-Pick Mode

Multi-Pick: When two parts are ready to pick, output both coordinates
 Force Multi-Pick: Flip until two parts are ready to pick

Buttons: Menü, OK, Abbrechen

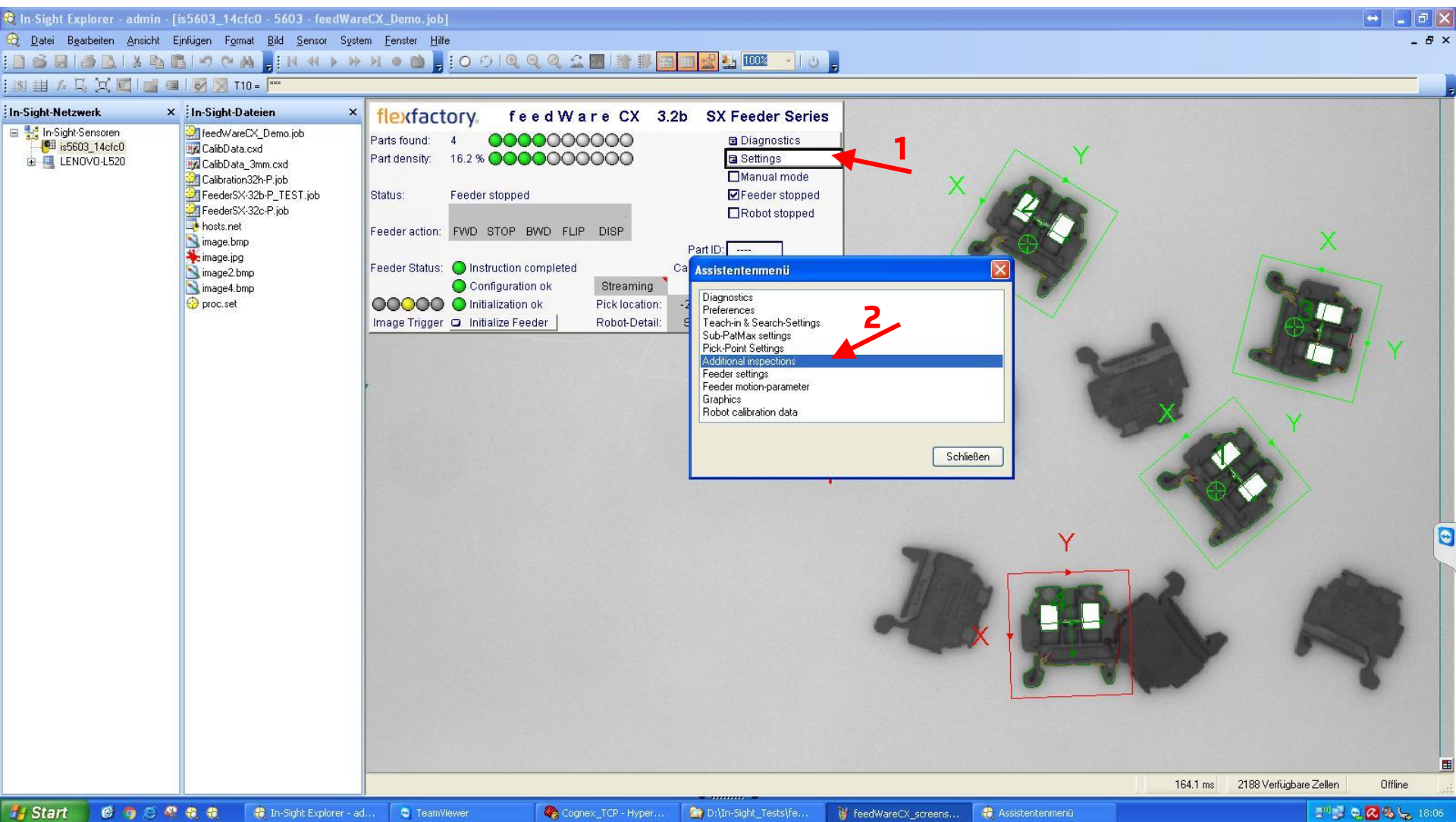
12. Pick-Point Offset anpassen

The screenshot displays the In-Sight Explorer software interface. The main window shows a robot vision system with several parts on a conveyor. A 'Pick-Point Settings' dialog box is open in the foreground, allowing for the adjustment of the pick-point offset. The dialog box contains the following information:

- Pick-Point Offset (relative to reference point)**
 - X-Offset: 4.20 [mm] (indicated by a red arrow)
 - Y-Offset: 0.00 [mm]
 - C-Offset (Angle): 90.00 [°] (-180°...+180°)
 - Source for X,Y,C: Use Main-PatMax as reference
- Part-sorting method**
 - Sorting method: Left to right
 - Set Sort-Point
- Multit-Pick Mode**
 - Multi-Pick: When two parts are ready to pick, output both coordinates
 - Force Multi-Pick: Flip until two parts are ready to pick

The background interface shows the 'flexfactory feedWare CX 3.2b SX Feeder Series' control panel. It displays 'Parts found: 4' and 'Part density: 16.2%'. The 'Feeder action' is set to 'FWD_STOP_BWD_FLIP_DISP'. The 'Feeder Status' shows 'Instruction completed', 'Configuration ok', and 'Initialization ok'. The 'Pick location' is -238.7 X, 370.8 Y, 90.0° C. The 'Robot-Detail' shows 'Status: waiting' and 'Task: Pick'. The main view shows a top-down perspective of the robot with green bounding boxes around parts and a red crosshair indicating the pick point. A red arrow points to the '1st Picked Part'.

13. Additional Inspections



14. Zusatzprüfung auswählen

The screenshot displays the In-Sight Explorer interface for a 'flexfactory feedWare CX 3.2b SX Feeder Series'. The main window shows a top status bar with 'Parts found: 4' and 'Part density: 16.2%'. Below this, there are sections for 'Feeder action' (FWD STOP BWD FLIP D) and 'Feeder Status' (Instruction completed, Configuration ok, Initialization ok). An 'Image Trigger' section includes an 'Initialize Feeder' button. A red arrow points to the 'Inspection active' checkbox for 'No 1: Clear-grip' in the 'Additional inspections' dialog box.

Additional inspections

====> Important: Apply settings always at '1st Picked Part' !!!

Inspection Name	Inspection active	Set region	Threshold	Apply region
No 1: Clear-grip	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>
No 2: Clear-grip	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>
No 3: Clear-grip	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>
No 4: Clear-Grip	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>
No 5: Contrast	<input type="checkbox"/>	<input checked="" type="checkbox"/>	25	<input checked="" type="checkbox"/>
No 6: Contrast	<input type="checkbox"/>	<input checked="" type="checkbox"/>	25	<input checked="" type="checkbox"/>

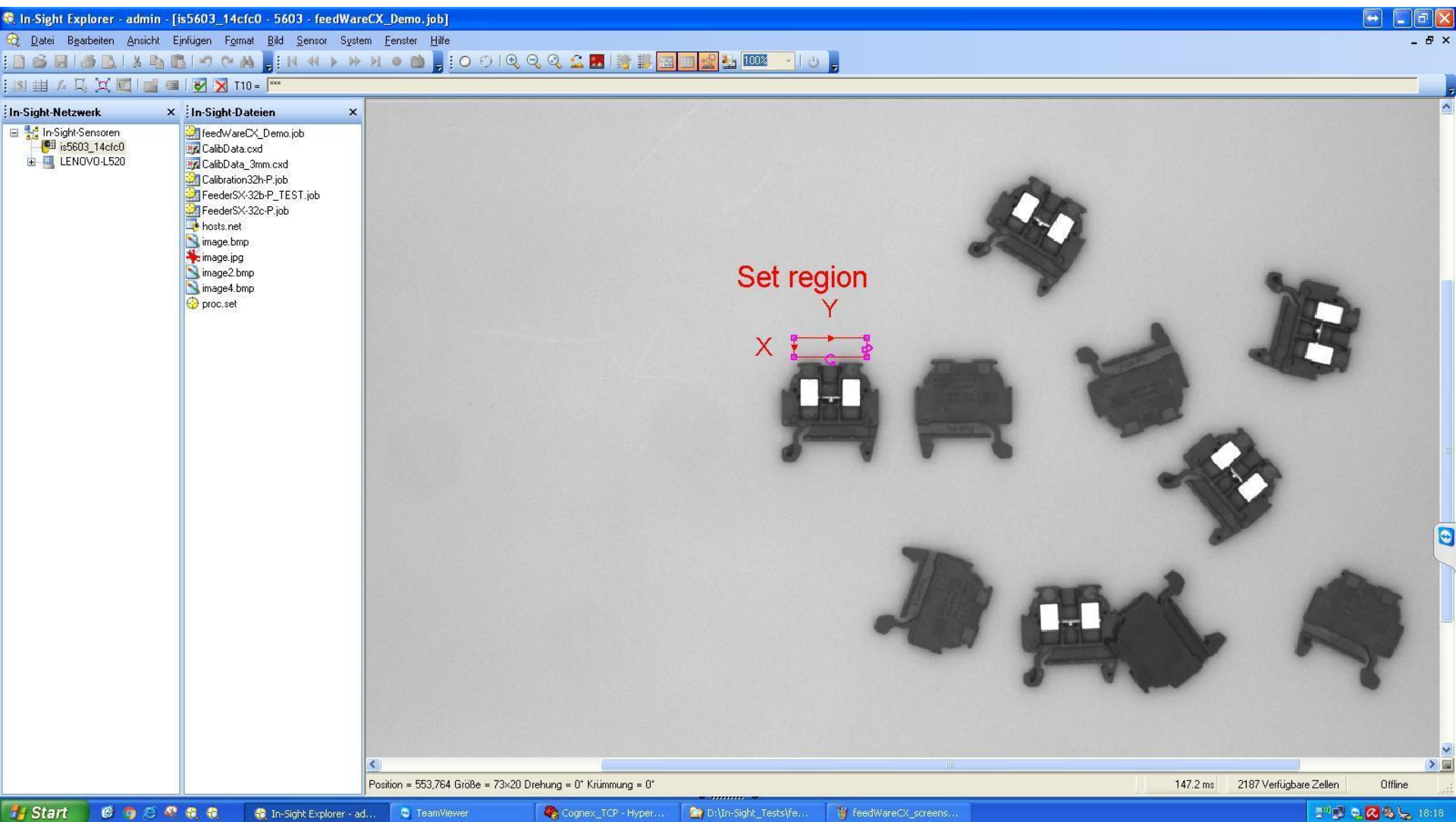
Directions

Region: First set the region at the '1st Picked Part' and hit Return, then click 'Apply region' to activate the change

Threshold: For Clear-Grip: Sets the coverage in %, above which the region is considered as 'not free'
For others: Sets the limit for the inspection to be fulfilled

Buttons: Menü, OK, Abbrechen

15. Freizone (Clear-Grip) setzen



16. Freizone referenzieren (Apply region)

The screenshot displays the In-Sight Explorer software interface. The main window shows a top status bar with 'flexfactory feedWare CX 3.2b SX Feeder Series'. Below this, there are statistics for 'Parts found: 4' and 'Part density: 16.2%'. The 'Feeder action' is 'FWD_STOP_BWD_FLIP_D'. The 'Feeder Status' includes 'Instruction completed', 'Configuration ok', and 'Initialization ok'. The 'Image Trigger' is set to 'Initialize Feeder'. A central configuration window titled 'Additional inspections' is open, featuring a yellow warning banner: '====> Important: Apply settings always at '1st Picked Part' !!!'. This window contains six inspection settings, each with a 'Set region' dropdown, a 'Threshold' input, and an 'Apply region' checkbox. A red arrow points to the 'Apply region' checkbox for 'No 1: Clear-grip'. The 'Directions' section at the bottom of the window provides instructions: 'Region: First set the region at the '1st Picked Part' and hit Return, then click 'Apply region' to activate the change' and 'Threshold: For Clear-Grip: Sets the coverage in %, above which the region is considered as 'not free'. For others: Sets the limit for the inspection to be fulfilled'. The background shows a camera view of a conveyor belt with parts and green bounding boxes. The Windows taskbar at the bottom shows the Start button and several open applications.

17a. Freizone prüfen

In-Sight Explorer - admin - [is5603_14cfc0 - 5603 - feedWareCX_Demo.job]

File Bearbeiten Ansicht Einfügen Format Bild Sensor System Fenster Hilfe

In-Sight-Netzwerk In-Sight-Dateien

flexfactory feedWare CX 3.2b SX Feeder Series

Parts found: 4
Part density: 16.2 %

Status: Feeder stopped

Feeder action: FWD STOP BWD FLIP DISP

Feeder Status:
● Instruction completed
● Configuration ok
● Initialization ok

Image Trigger: Initialize Feeder

Diagnostics
Settings
 Manual mode
 Feeder stopped
 Robot stopped

Part ID: ----
Calib-File: CalibData.cxd

Streaming	X	Y	C
Pick location:	-238.8	370.8	89.7°
Robot-Detail:	Status: waiting	Task: Pick	

1st Picked Part

147.4 ms 2187 Verfügbare Zellen Offline

17b. Freizone prüfen

The screenshot displays the In-Sight Explorer software interface for a flexfactory feedWare CX 3.2b SX Feeder Series. The interface is divided into several sections:

- Left Panel:** Contains a file explorer for 'In-Sight-Dateien' with files like CalibData.cxd, Calibration32h-P.job, and FeederSX-32b-P_TEST.job.
- Top Panel:** Shows 'flexfactory feedWare CX 3.2b SX Feeder Series' with status indicators for 'Parts found: 3' and 'Part density: 16.2%'. It also includes a 'Feeder action' dropdown (FWD, STOP, BWD, FLIP, DISP) and a 'Feeder Status' section with indicators for 'Instruction completed', 'Configuration ok', and 'Initialization ok'. A table shows 'Pick location' coordinates (-288.6, 410.4, 58.3°) and 'Robot-Detail' (Status: waiting, Task: Pick).
- Main View:** A top-down view of the robot arm with several parts. One part is highlighted with a red box and labeled '1st Picked Part'. Green boxes and 'X'/'Y' axes indicate the robot's field of view and pick location.
- Bottom Panel:** Displays system information: 'Pixelwert bei (632,964) = 200', '149.1 ms', '2187 Verfügbare Zellen', and 'Offline'.

17c. Freizone prüfen

In-Sight Explorer - admin - [is5603_14cfc0 - 5603 - feedWareCX_Demo.job]

File Bearbeiten Ansicht Einfügen Format Bild Sensor System Fenster Hilfe

In-Sight-Netzwerk In-Sight-Dateien

flexfactory feedWare CX 3.2b SX Feeder Series

Parts found: 2
Part density: 16.2 %

Status: Feeder stopped

Feeder action: FWD STOP BWD FLIP DISP

Feeder Status:
● Instruction completed
● Configuration ok
● Initialization ok

Image Trigger: Initialize Feeder

Part ID: ----
Calib-File: CalibData.cxd

Streaming	X	Y	C
<input type="checkbox"/>	-252.0	433.1	40.0°

Robot-Detail: Status: waiting Task: Pick

Pixelwert bei (866,872) = 188

217.6 ms 2187 Verfügbare Zellen Offline

Start In-Sight Explorer - ad... TeamViewer Cognex_TCP - Hyper... D:\In-Sight_Tests\fe... feedWareCX_screens... 18:30

18. weitere Freizonen setzen

The screenshot displays the In-Sight Explorer software interface for a flexfactory feedWare CX 3.2b SX Feeder Series. The interface is divided into several sections:

- Left Panel:** Contains two tree views: "In-Sight-Netzwerk" (In-Sight Network) and "In-Sight-Dateien" (In-Sight Files). The "In-Sight-Dateien" view shows a list of files including calibration data (.cxd), job files (.job), and image files (.bmp, .jpg).
- Top Panel:** Displays the software title "flexfactory feedWare CX 3.2b SX Feeder Series" and various status indicators. It shows "Parts found: 2" and "Part density: 16.2%". The "Feeder Status" section includes indicators for "Instruction completed", "Configuration ok", and "Initialization ok". The "Image Trigger" section has an "Initialize Feeder" button.
- Right Panel:** Contains a "Diagnostics" and "Settings" menu. The "Settings" menu is open, showing options for "Manual mode", "Feeder stopped", and "Robot stopped". Below this, a "Part ID" field is empty, and a "Calib-File" field is set to "CalibData.cxd". A table shows "Pick location" coordinates: X: -252.0, Y: 433.1, C: 40.0°. The "Robot-Detail" section shows "Status: waiting" and "Task: Pick".
- Main View:** A top-down view of the robot cell. The robot is a black mobile base with a camera. Several parts are scattered on the floor. Red and green bounding boxes and coordinate axes (X, Y) are overlaid on the parts, indicating the robot's current pick location and the "1st Picked Part".
- Bottom Panel:** Shows system information: "Pixelwert bei (907,813) = 207", "151.9 ms", "2187 Verfügbare Zellen", and "Offline".

19a. Kontrolle 1

The screenshot displays the In-Sight Explorer software interface for a robotic feeding station. The main window is titled "flexfactory feedWare CX 3.2b SX Feeder Series".

Control Panel (Left):

- Parts found: 3 (indicated by 3 green circles)
- Part density: 16.2% (indicated by 16.2% green circles)
- Status: Feeder stopped
- Feeder action: FWD STOP BWD FLIP DISP
- Feeder Status:
 - Instruction completed (green circle)
 - Configuration ok (green circle)
 - Initialization ok (green circle)
- Image Trigger: Initialize Feeder

Settings Panel (Right):

- Part ID: ----
- Calib-File: CalibData.cxd
- Streaming: X Y C
- Pick location: -238.8 370.7 90.1°
- Robot-Detail: Status: waiting Task: Pick

Workspace View (Center):

The workspace view shows a top-down perspective of the robot's environment. The robot is positioned in the center, surrounded by several dark-colored parts. The robot's path is indicated by green arrows. A red box highlights the robot's current position, and a red text label "1st Picked Part" is overlaid on the robot. The workspace is marked with X and Y coordinates.

System Information (Bottom Right):

- 219.5 ms
- 2187 Verfügbare Zellen
- Offline

19b. Kontrolle 2



20. Speichern und fertig.

Bereit zum Abgreifen mit dem Roboter

Die Erkennung ist nun eingerichtet und der Kamera-Job wird unter dem entsprechenden Namen gespeichert. Jetzt können diese Teile mit dem Roboter abgeholt werden.