

# Arkite Operator Support System (OSS)

Les 5: Programmeren van processen

# Leerdoelen

Na het volgen van deze module:

- Weet je wat processen zijn
- Kun je processen zelf programmeren
- Ben je bewust van waarop je moet letten bij programmeren

# Inhoudsopgave

- Wat zijn processen?
- Hoe voeg je processen toe?
- Waarop moet je letten bij programmeren van processen?

# Wat is een proces?

## Een stappenplan

Een proces bestaat uit alle stappen die je in je werkproces moet doorlopen.

Meerdere processen samen maken het uiteindelijke project.

The screenshot displays a software interface for configuring a process. At the top, there is a toolbar with icons for undo, redo, and a 'PDF Export' button. Below the toolbar is a table with the following data:

Process Name	Start by
Process	<input type="radio"/> Project Loaded

Below the table is a menu with the following options:

- Columns
- Variants and Conditions
- Instructions
- None

Below the menu is another toolbar with icons for undo, redo, and buttons for 'Go To', 'Auto detect', and navigation arrows. Below the toolbar is a table with the following data:

	Text instruction (en-NL)	Image Instruction	Action
Filter...	<input type="checkbox"/> Filter...	<input type="checkbox"/> Filter...	<input type="checkbox"/> Filter...
Root step 1/2 <input type="radio"/>			
<input type="checkbox"/> Take Object t... <input checked="" type="radio"/>	Pak toetsenbord uit gele...		Take
<input checked="" type="checkbox"/> Activity toets... <input type="radio"/>	Plaats toetsenbord in ge...		Activ
<input type="checkbox"/> Place Object t... <input type="radio"/>	Leg toetsenbord terug o...		Plac

# Wat is een proces?

Om het duidelijker te maken, wordt op de volgende dia een voorbeeld gegeven.

In dit voorbeeld is het project “het maken van een omelet”.

De processen zijn de handelingen die hiervoor nodig zijn.

Ieder proces bestaat uit stappen waaruit de handeling bestaat.

# Wat is een proces?

## Project

Het maken van  
een omelet

## Proces

1. Ei pakken
2. Ei breken
3. Ei klutsen
4. Ei bakken

### Stappen bij 1.

Open kast  
Pak doos eieren  
Pak ei

...

### Stappen bij 3.

Pak vork  
Doe vork in ei  
Kluts ei met vork

...

### Stappen bij 2.

Pak schaal  
Pak ei vast  
Breek ei in schaal

...

### Stappen bij 4.

Pak pan  
Zet vuur aan  
Doe ei in pan

...

# Processen aanmaken

In de volgende dia's gaan we zelf processen aanmaken.

Menu Main

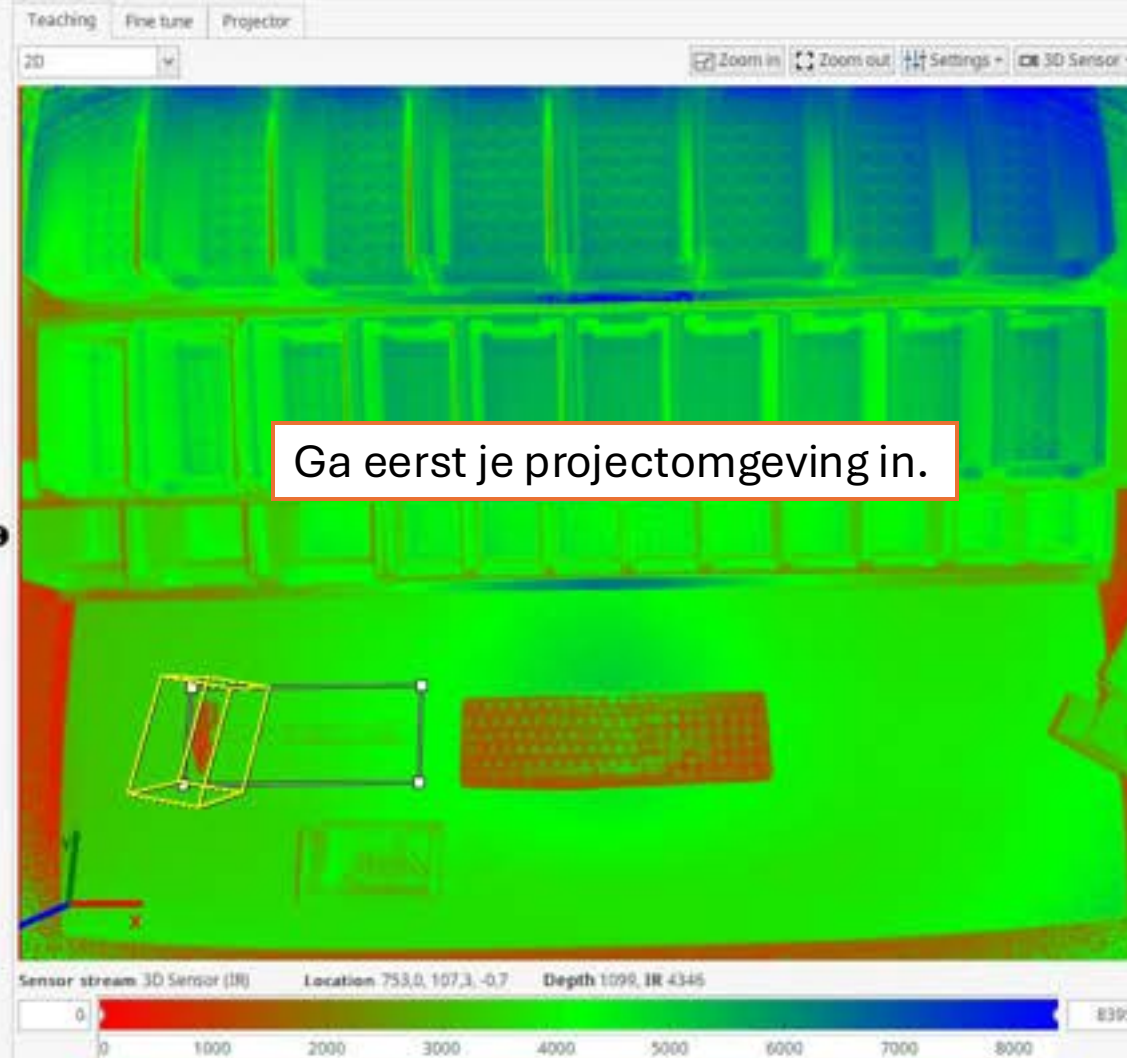
Run Properties Versions Restart Live Record Auto Record Recordings Variables Conditions Variants Images Materials Tasks Instructions Experience Level Color Templates Maintenance Log Tables Properties Panel Show all displays Help

Project Recordings Project Global Workstation Server View

Processes Connectivity

Detections

Name	Type
Filter...	Filter...
hamer	Tool
toetsenbord	Object
krifjes	Container



Ga eerst je projectomgeving in.

Without Tool

With Tool

Set working zone to include object of interest, but to exclude operator and other variable content. Teaching complies with and without snapshots.

Detection mode Automatic

Position tolerance Narrow (50%)

Adjust projection

Teach

Detection

Name 001020000000000000

hamer

Type Tool

Show error visualizations

Enabled On

Tool connection settings No

External Trigger Variable Please select a variable

Location/Size based on variable

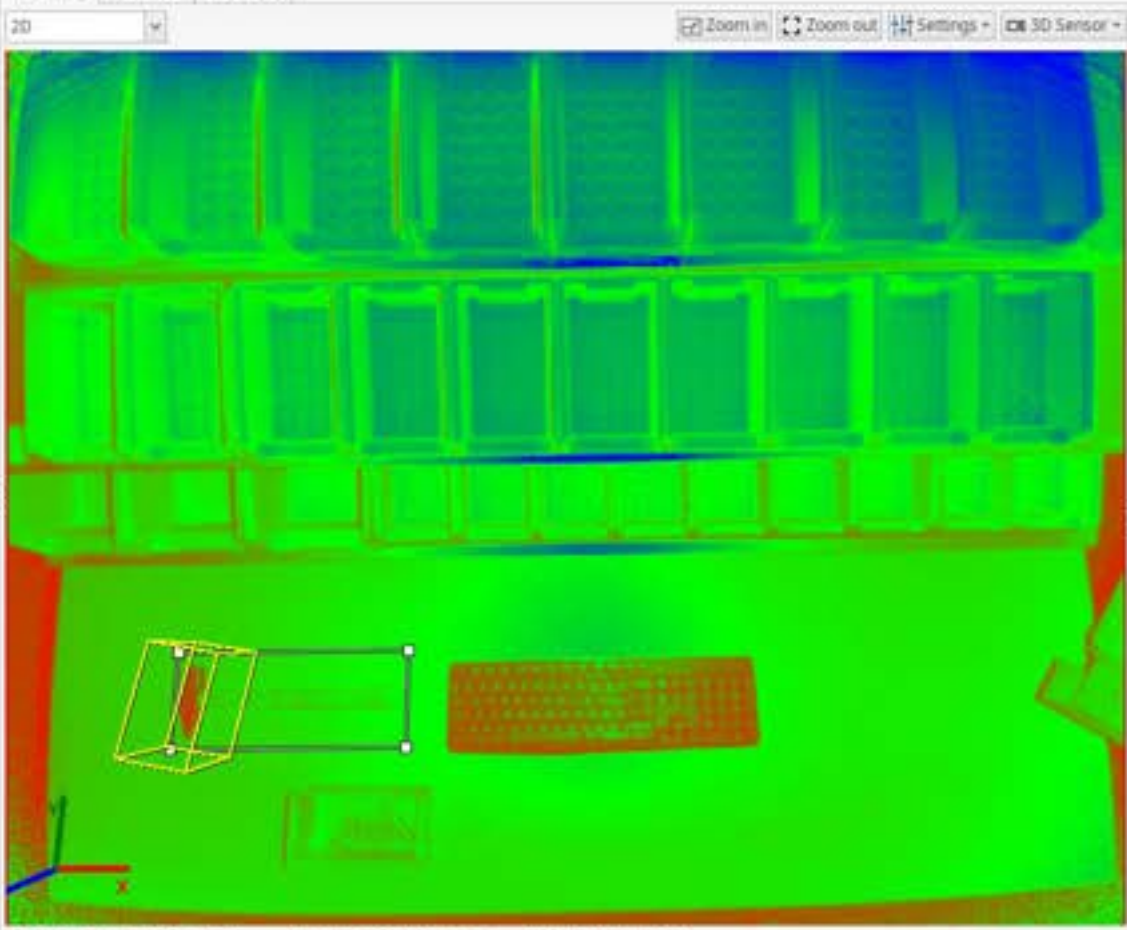
Run Properties Live Recordings Variables Conditions Variables Images Materials Tools Testruns Experience Color Templates Maintenance Log Tables Properties Panel Search  
 Restart Auto Record Show all displays Help

Druk op "Processes" om processen aan te maken.



Detections

Name	Type
Filter...	Filter...
hamer	Tool
toetsenbord	Object
krijtes	Container



Set working zone to include object of interest, but to exclude operator and other variable content. Teaching compares with and without snapshots.

Detection mode: Automatic

Position tolerance: Narrow (50%...)

Adjust projection:

Teach

Detection

Name: ID: 1020000000000000

Name: hamer

Type: Tool

Show error visualizations:

Enabled: On

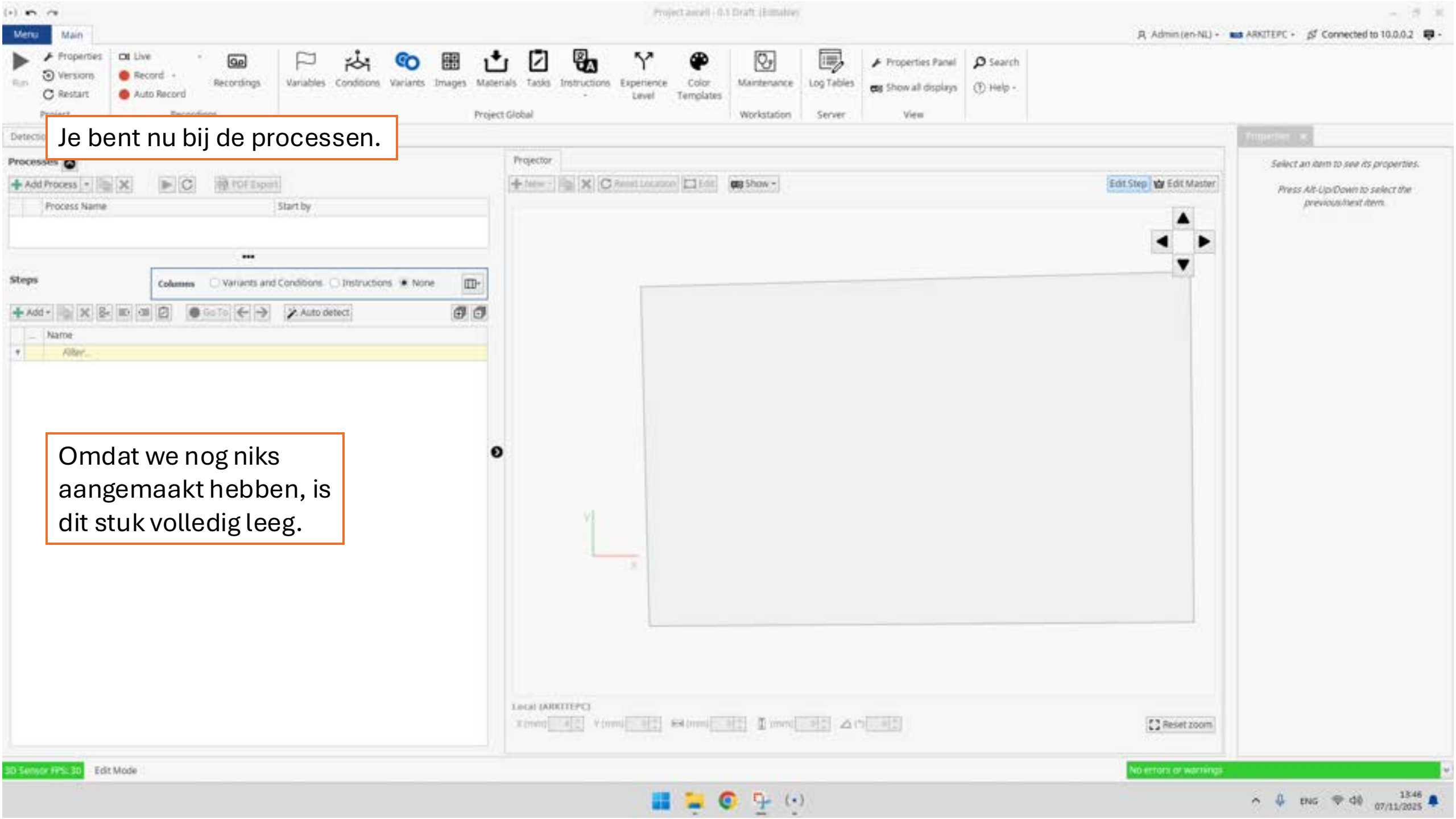
Tool connection settings: No

External Trigger variable: Please select a variable

Location/Size based on variable:

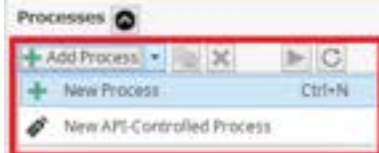
Je bent nu bij de processen.

Omdat we nog niks aangemaakt hebben, is dit stuk volledig leeg.





Detections Processes Connectivity

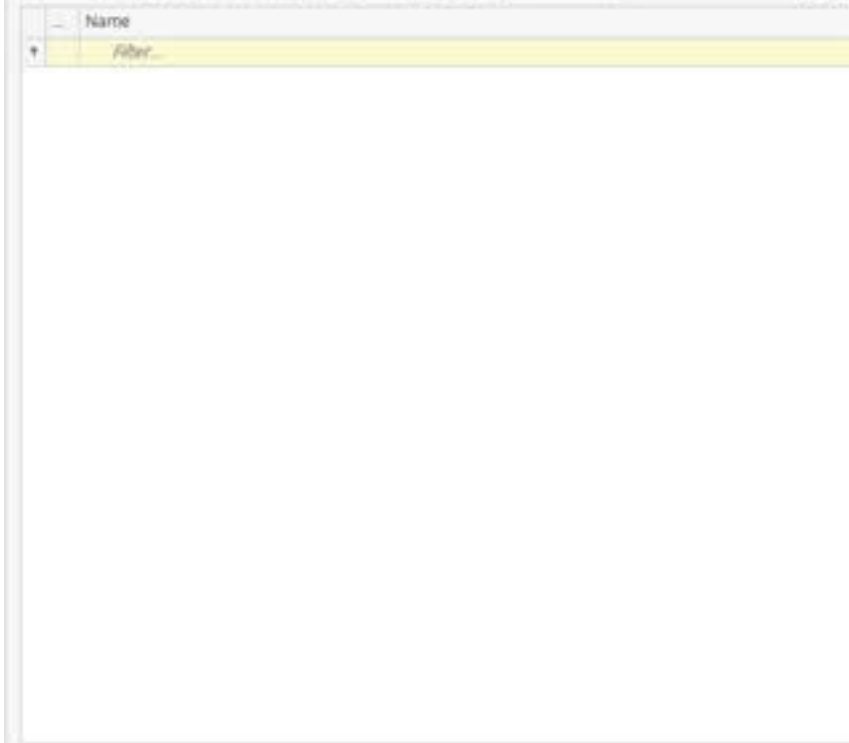


Om een proces aan te maken,  
druk je op "Add Process".

Daarna druk je op  
"New Process".

Steps Columns Variants and Conditions Instructions

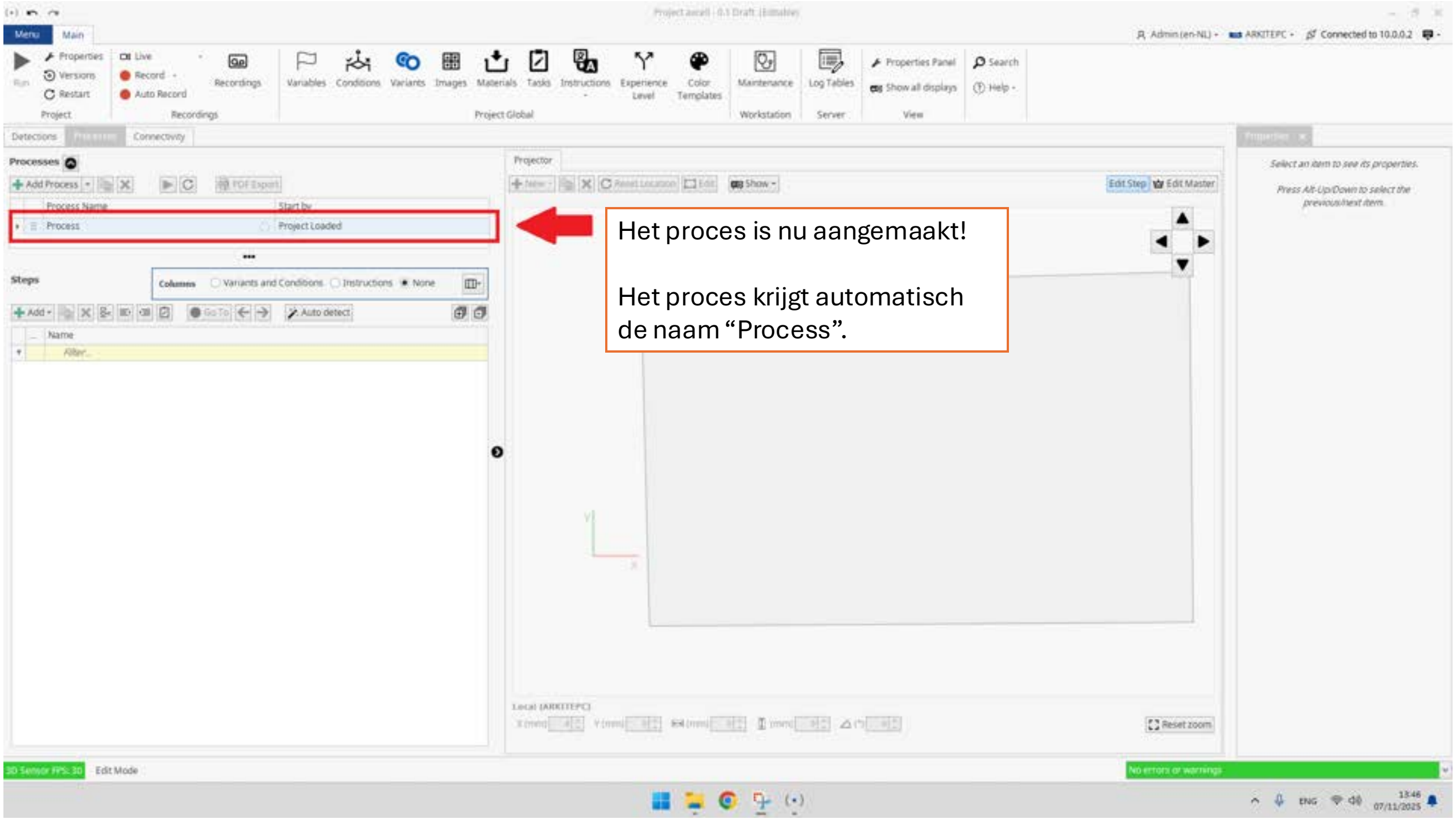
Add Go To Auto detect



Local (ARKITEPC)

X (mm) Y (mm) Z (mm) I (mm) Δ (°)

Reset zoom



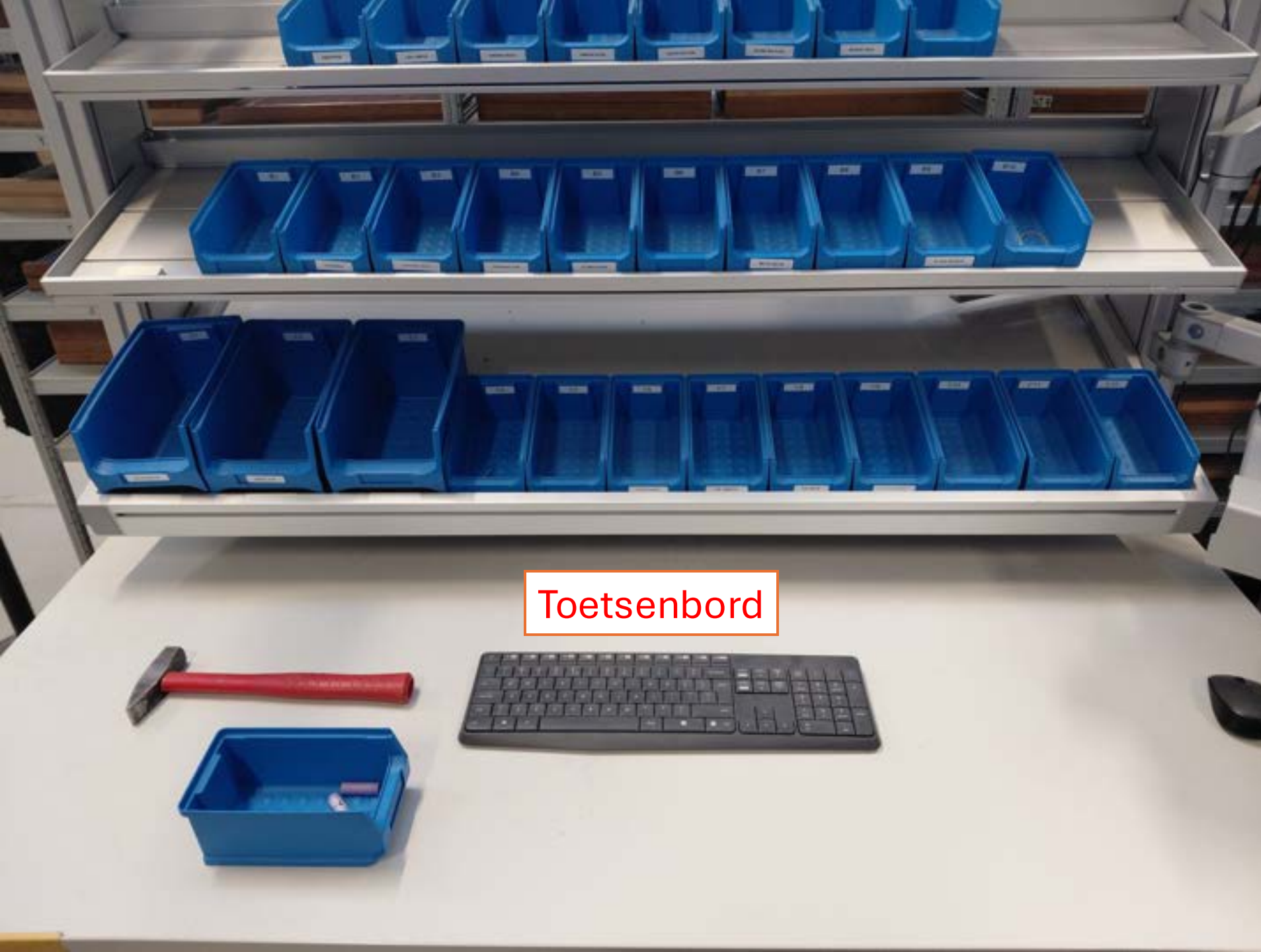
Het proces is nu aangemaakt!

Het proces krijgt automatisch de naam "Process".

# Processen aanmaken

In het volgende voorbeeld gaan we een simpel proces aanmaken, dat bestaat uit drie stappen:

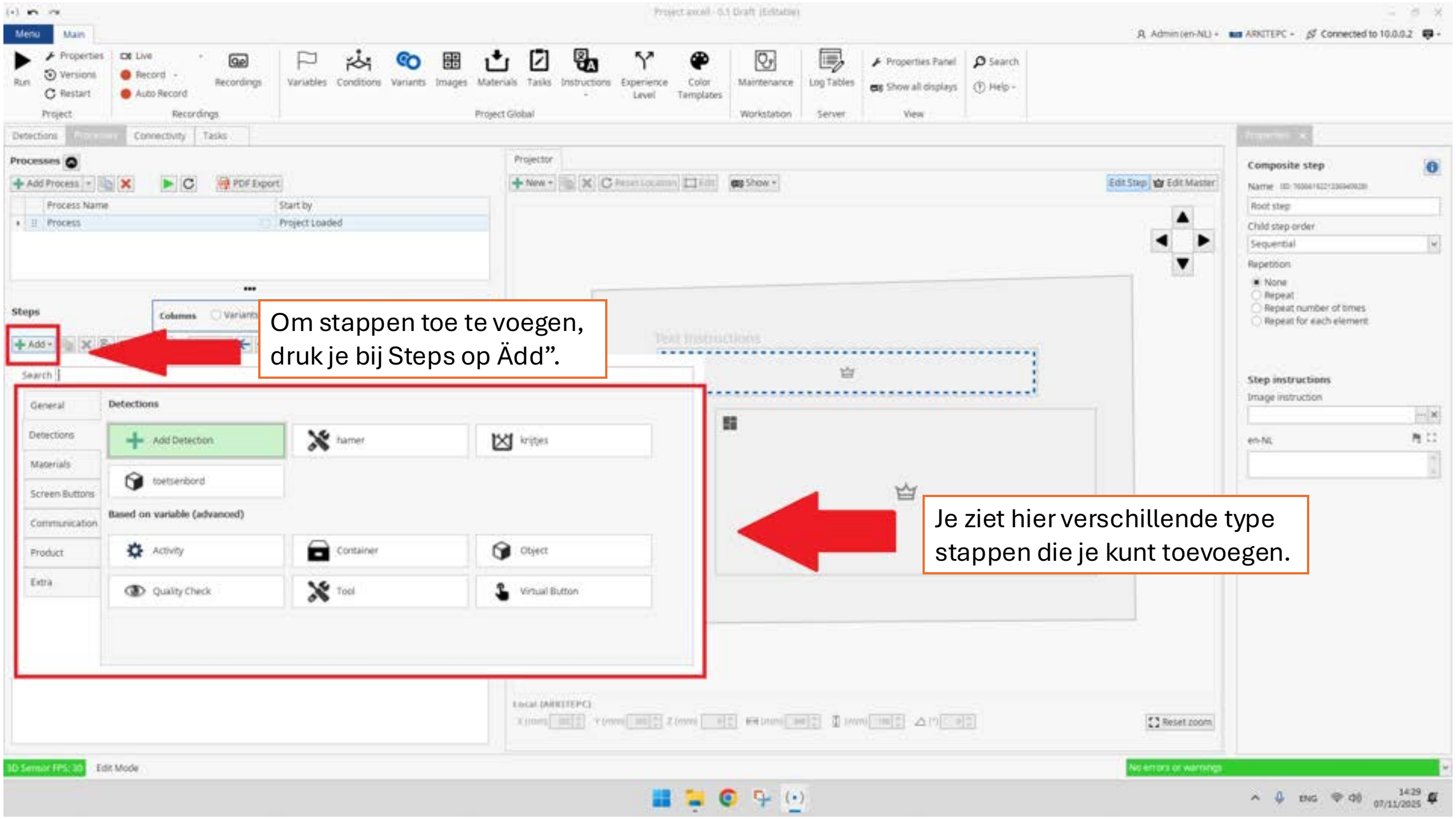
1. Het pakken van een toetsenbord
2. Het neerleggen van het toetsenbord iets onder de oorspronkelijke plaats, en ook snel weer oppakken
3. Het terugleggen van het toetsenbord op z'n plaats



Toetsenbord

Het werkblad in dit voorbeeld is links te zien.

Voor de uitwerking van het proces in dit voorbeeld, maken we dus gebruik van het toetsenbord.



Om stappen toe te voegen, druk je bij Steps op 'Add'.

Je ziet hier verschillende type stappen die je kunt toevoegen.

Menu Main

Run Properties Live Record Recordings Variables Conditions Variants Images Materials Tasks Instructions Experience Level Color Templates Maintenance Log Tables Properties Panel Search Show all displays Help

Project Recordings Project Global Workstation Server View

Detections Processes Connectivity Tasks

Processes

+ Add Process PDF Export

Process Name	Start by
Process	Project Lo

Onze eerste stap in dit voorbeeld is het pakken van het toetsenbord.

Steps

Columns Variants and Conditions

+ Add Go To Auto detect

Search

General

Detections

+ Add Detection

toetsenbord

Based on variable (advanced)

Place Take

Activity Container Object

Quality Check Tool Virtual Button

Druk hiervoor op "Add detection" en daarna op "Take".

Projector

+ New Reset Location Edit Show

Edit Step Edit Master

Test instructions

Image instruction

en-NL

Local (ARKITEPC)

X (mm) Y (mm) Z (mm) Rot (mm) Tilt (mm) Δ (°)

Reset zoom

Properties

Composite step

Name ID: 769601821326940028

Root step

Child step order

Sequential

Repetition

None Repeat Repeat number of times Repeat for each element

Step instructions

Image instruction

en-NL



Processes

Process Name	Start by
Process	Project Loaded

Steps

Name	Text instruction (en-NL)	Image Instruction	Action
Filter...	Filter...	Filter...	Filter...
Root step			
Take Object t...	Take toetsenbord		Take Object



De eerste stap is aangemaakt!

Projector

Text Instructions



Het gele vlak is het gebied waaruit het toetsenbord gepakt zal worden.

Properties

Detection step

Name: id-1143b378105054

Take Object toetsenbord

Step instructions

Image instruction

en-NL

Take toetsenbord



Het gele vlak is ook zichtbaar op je werkblad.

Boven het vlak wordt gelijk de instructie geprojecteerd.

De instructie kan helderder; dat gaan we nu veranderen.

Menu Main

Run Properties Live Recordings Variables Conditions Variants Images Materials Tasks Instructions Experience Level Color Templates Maintenance Log Tables Properties Panel Search Show all displays Help

Project Recordings Project Global Workstation Server View

...en daarna op "Edit Master".

Detections Processes Connectivity Task

Processes

+ Add Process PDF Export

Process Name	Start by
Process	Project Loaded

Steps

Columns Variants and Conditions Instructions None

Name	Text instruction (en-NL)	Image Instruction	Action
Root step	Filter...	Filter...	Filter...
Take Object t...	Take toetsenbord		Take Object

Projector

+ New Edit Show

Edit Step Edit Master

Druk eerst op het tekstvlak...

1

2

Detection step

Name id-614b379940504a

Take Object toetsenbord

Step instructions

Image instruction

en-NL

Take toetsenbord

Local (ARKITEPC)

X (mm) 39 Y (mm) 20 Z (mm) 0 Rot (mm) 00 Tilt (mm) 10 Δ (°) 0

Reset zoom

Menu Main

Run Versions Restart Project

Properties Live Record Auto Record Recordings

Variables Conditions Variants Images Materials Tasks Instructions Experience Level Color Templates Maintenance Log Tables Workstation Server View

Properties Panel Search Show all displays Help

Detections Processes Connectivity Tasks

Processes

+ Add Process PDF Export

Process Name	Start by
Process	Project Loaded

Steps

+ Add

Name	Filter	Filter	Filter	Filter
Root step				
Take Object t...				
Leg toetsenbord hieron...				
Take Object				

De volgende stap is het toetsenbord iets onder de oorspronkelijke plaats neerleggen.

We veranderen de instructie dan ook naar "Leg toetsenbord hieronder neer."

Projector

+ New Reset Location Edit Show Edit Step Edit Master

Local (ARKITEPC)

X (mm) Y (mm) Z (mm) Roll (mm) Pitch (mm) Tilt (°)

Reset zoom

Properties

Text

Step instructions

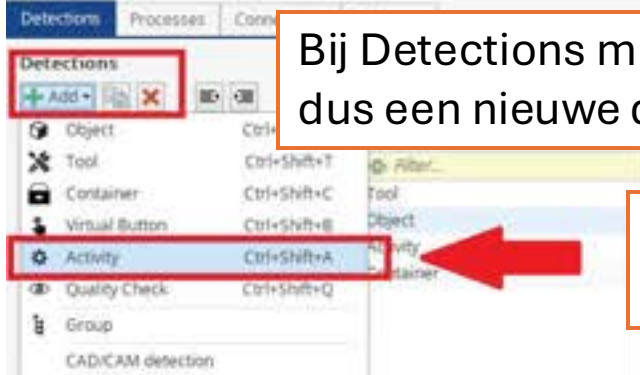
en-NL

Leg toetsenbord hieronder neer

# Tussenstap: activity maken

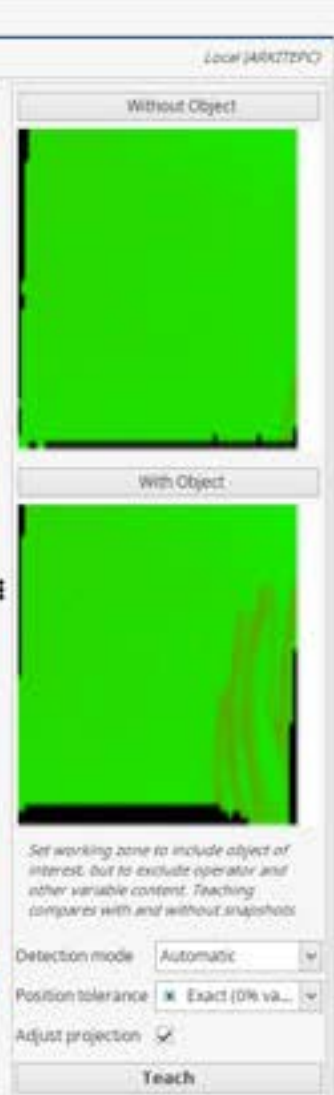
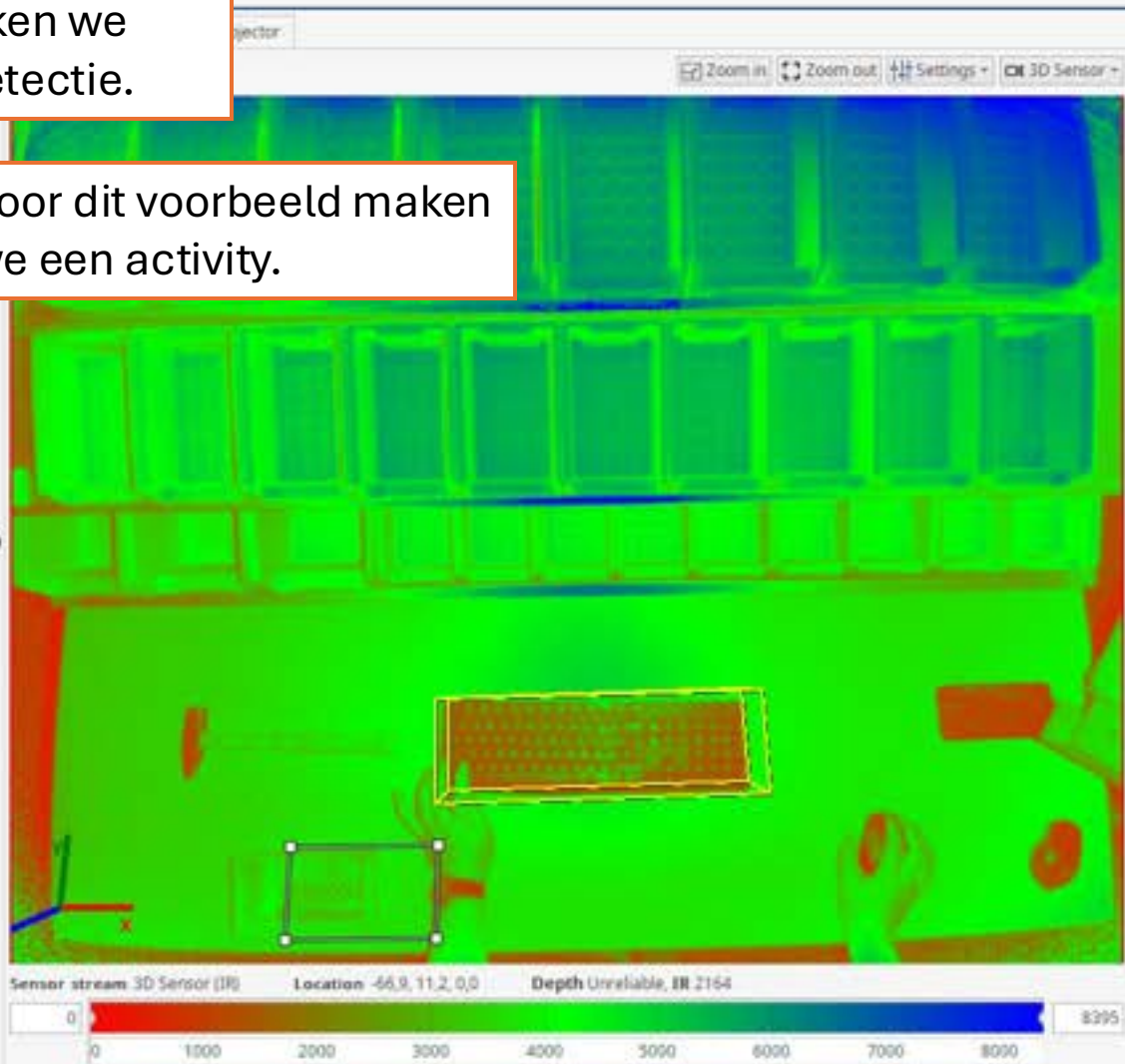
Om het proces te ondersteunen, maken we een **activity** aan.

Dit is een detectiezone net zoals tools en objects.



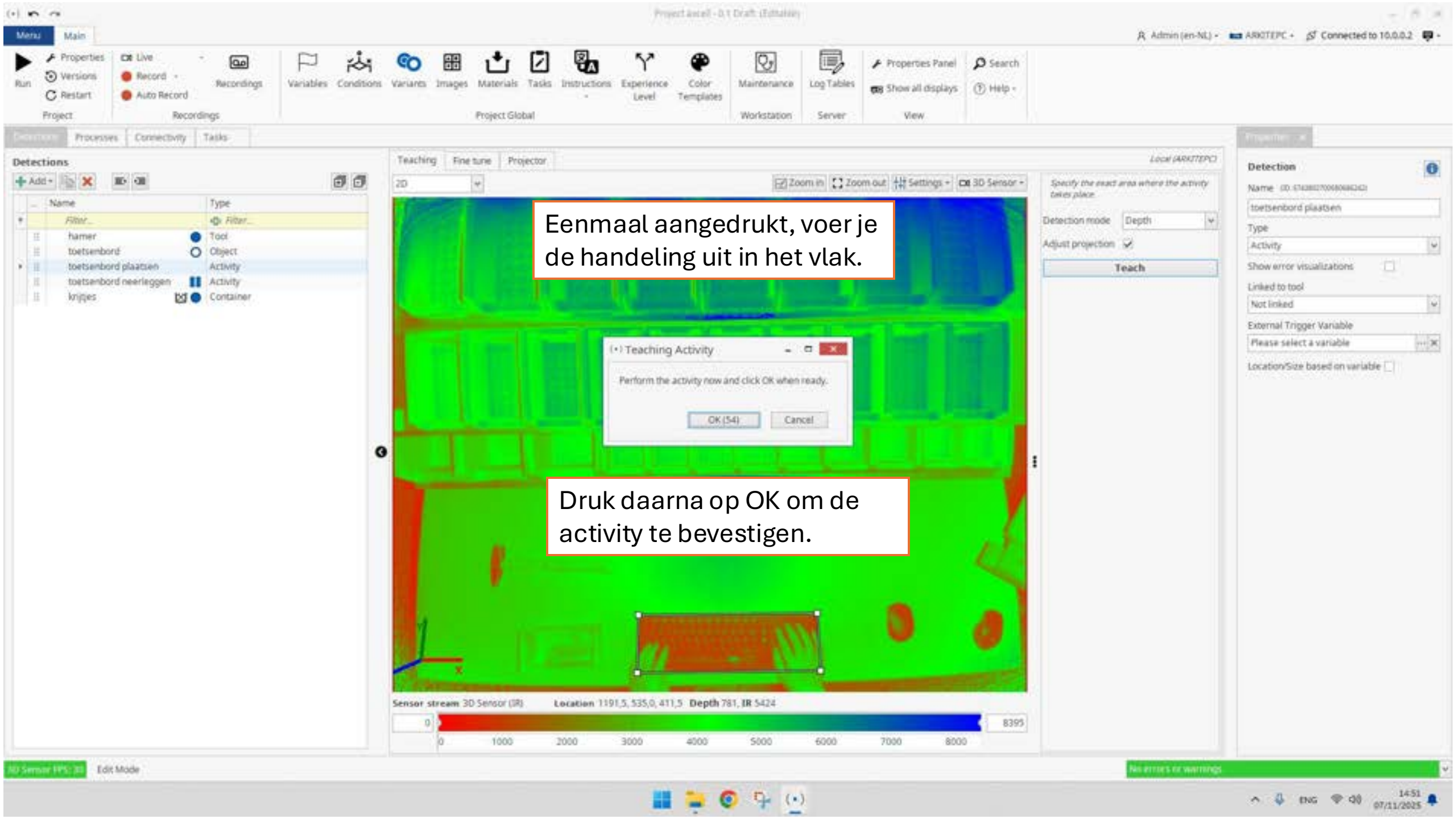
Bij Detections maken we dus een nieuwe detectie.

Voor dit voorbeeld maken we een activity.









Eenmaal aangedrukt, voer je de handeling uit in het vlak.

Druk daarna op OK om de activity te bevestigen.

Menu Main

Run Properties Versions Restart Live Record Auto Record Recordings

Project Global

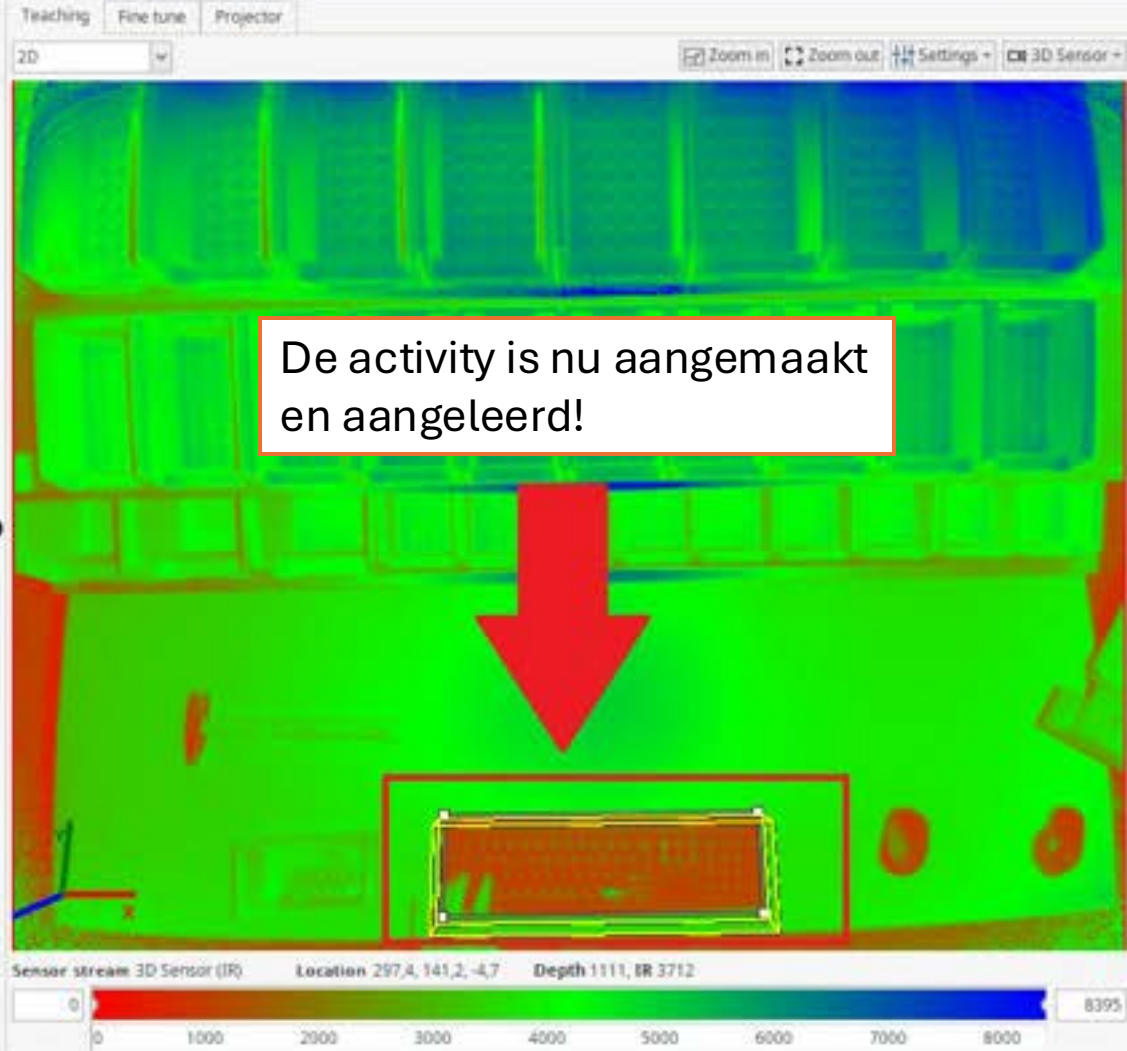
Variables Conditions Variants Images Materials Tasks Instructions Experience Level Color Templates Maintenance Log Tables Properties Panel Search Show all displays Help

Workstation Server View

Detections Processes Connectivity Tasks

Detections

Name	Type
Filter...	Filter...
hamer	Tool
soetsenbord	Object
soetsenbord plaatsen	Activity
soetsenbord neerleggen	Activity
knijps	Container



De activity is nu aangemaakt en aangeleerd!

Local (ARKTEPC)

Specify the exact area where the activity takes place:

Detection mode: Depth

Adjust projection:

Teach

Properties

Detection

Name: ID-5168827069068320

toetsenbord plaatsen

Type: Activity

Show error visualizations:

Linked to tool: Not linked

External Trigger Variable: Please select a variable

Location/Size based on variable:

Run: Properties, Versions, Restart, Project

Recordings: Live, Record, Auto Record

Project Global: Variables, Conditions, Variants, Images, Materials, Tasks, Instructions, Experience Level, Color Templates

Workstation: Maintenance, Log Tables, Server

View: Properties Panel, Show all displays, Search, Help

Detections: Processes, Connectivity, Tasks

Processes: Add Process, PDF Export

Process Name	Start by
Process	Project Loaded

Steps: Columns, Variants and Conditions, Instructions, None

Name	Text instruction (en-NL)	Image Instruction	Action
Filter...	Filter...	Filter...	Filter...
Root step			
Take Object t...	Pak toetsenbord uit gele...		Take Object

Projector: New, Reset Location, Edit, Show

Edit Step, Edit Master

Text Instructions

Local (ARKITEPC)

X (mm): 200, Y (mm): 200, Z (mm): 0, Rot (mm): 0, 0, 0

Reset zoom

Ga nu weer terug naar Processes om verder te gaan.

Properties

Detection step

Name: 0b14102d79e0000000

Take Object toetsenbord

Step instructions

Image instruction

en-NL

Pak toetsenbord uit gele vlak

Menu Main

Run Properties Versions Restart Project

Recordings Live Record Auto Record

Project Global Variables Conditions Variants Images Materials Tasks Instructions Experience Level Color Templates

Workstation Server View Properties Panel Search Show all displays Help

Detections Processes Connectivity Tasks

Processes

+ Add Process PDF Export

Process Name	Start by
Process	Project Loaded

Steps

Columns Variants and Conditions Instructions None

+ Add Go To Auto detect

Projector

+ New Reset Location Edit Show Edit Step Edit Master

INSTRUCTIONS

Local (ARKTEPC)

X (mm) Y (mm) Z (mm) RX (mm) RY (mm) RZ (mm)

Reset zoom

Properties

Detection step

Name id: 6420237800000000

Take Object toetsenbord

Step instructions

Image instruction

en-NL

Pak toetsenbord uit gele vlak

Search

General Detections

+ Add Detection

toetsenbord

Based on variable (advanced)

Activity

Quality Check

hamer

krigjes

toetsenbord plaatsen

Activity

Container

Object

Tool

Virtual Button



Nu voegen we onze nieuwe activity toe als stap aan het proces.

Menu Main

Run Properties Live Recordings Variables Conditions Variants Images Materials Tasks Instructions Experience Level Color Templates Maintenance Log Tables Properties Panel Search Show all displays Help

Project Recordings Project Global Workstation Server View

Detections Processes Connectivity Tasks

Processes

+ Add Process X C PDF Export

Process Name	Start by
Process	Project Loaded

Steps

Columns Variants and Conditions Instructions None

+ Add X C Go To Auto detect

Name	Text instruction (en-NL)	Image instruction	Action
Filter...	Filter...	Filter...	Filter...
Root step			
Take Object t...	Pak toetsenbord uit gele...		Take Object
Activity toets...	toetsenbord plaatsen		Activity

De stap is toegevoegd!

Projector

+ New X C Reset Location Edit Show Edit Step Edit Master

Local (ARKITEPC)

X (mm) Y (mm) Z (mm) R (mm) I (mm) Reset zoom

Properties

Detection step

Name: id:xxxxxxxxxxxx

Activity toetsenbord plaatsen

Step instructions

Image instruction

en-NL

toetsenbord plaatsen

*Plaats toetsenbord in gele vlak en pak hem weer op*



Ook op het werkblad is de nieuwe activity zichtbaar!

Bij deze is de instructie al aangepast: niet vergeten zelf te doen!

Run: Properties, Versions, Restart, Project

Recordings: Live, Record, Auto Record

Project Global: Variables, Conditions, Variants, Images, Materials, Tasks, Instructions, Experience Level, Color Templates

Workstation: Maintenance, Log Tables

Server: Properties Panel, Show all displays, Search, Help

Detections | Processes | Connectivity | Tasks

Processes: Add Process, PDF Export

Process Name	Start by
Process	Project Loaded

Steps: Columns, Variants and Conditions, Instructions, None

Buttons: Add, Go To, Auto detect

Projector: New, Reset Location, Show, Edit Step, Edit Master

Instructions: toetsenbord plaatsen

Visual representation of a workspace with a yellow box and a blue dashed box.

Detection step

Name: itb-ssomxxxxxtoetsenb

Activity toetsenbord plaatsen

Step instructions

Image instruction

en-NL

Plaats toetsenbord in gele vlak en leg je handen erop

Detections

- + Add Detection
- toetsenbord
  - Place
  - Take
- Based on variable (adj)
- Activity
- Quality Check

- toetsenbord plaatsen
- Container
- Tool
- Virtual Button

Tenslotte maken we een laatste stap aan voor het terugleggen.

Run: Properties, Versions, Restart  
 Project: Live, Record, Auto Record  
 Recordings: Recordings  
 Project Global: Variables, Conditions, Variants, Images, Materials, Tasks, Instructions, Experience Level, Color Templates  
 Workstation: Maintenance, Log Tables  
 Server: Properties Panel, Show all displays  
 View: Search, Help

Detections Processes Connectivity Tasks

Processes

+ Add Process [X] [C] PDF Export

Process Name	Start by
Process	Project Loaded

Steps

Columns: Variants and Conditions, Instructions, None

+ Add [X] [C] [D] [E] [F] [G] [H] [I] [J] [K] [L] [M] [N] [O] [P] [Q] [R] [S] [T] [U] [V] [W] [X] [Y] [Z] [AA] [AB] [AC] [AD] [AE] [AF] [AG] [AH] [AI] [AJ] [AK] [AL] [AM] [AN] [AO] [AP] [AQ] [AR] [AS] [AT] [AU] [AV] [AW] [AX] [AY] [AZ] [BA] [BB] [BC] [BD] [BE] [BF] [BG] [BH] [BI] [BJ] [BK] [BL] [BM] [BN] [BO] [BP] [BQ] [BR] [BS] [BT] [BU] [BV] [BW] [BX] [BY] [BZ] [CA] [CB] [CC] [CD] [CE] [CF] [CG] [CH] [CI] [CJ] [CK] [CL] [CM] [CN] [CO] [CP] [CQ] [CR] [CS] [CT] [CU] [CV] [CW] [CX] [CY] [CZ] [DA] [DB] [DC] [DD] [DE] [DF] [DG] [DH] [DI] [DJ] [DK] [DL] [DM] [DN] [DO] [DP] [DQ] [DR] [DS] [DT] [DU] [DV] [DW] [DX] [DY] [DZ] [EA] [EB] [EC] [ED] [EE] [EF] [EG] [EH] [EI] [EJ] [EK] [EL] [EM] [EN] [EO] [EP] [EQ] [ER] [ES] [ET] [EU] [EV] [EW] [EX] [EY] [EZ] [FA] [FB] [FC] [FD] [FE] [FF] [FG] [FH] [FI] [FJ] [FK] [FL] [FM] [FN] [FO] [FP] [FQ] [FR] [FS] [FT] [FU] [FV] [FW] [FX] [FY] [FZ] [GA] [GB] [GC] [GD] [GE] [GF] [GG] [GH] [GI] [GJ] [GK] [GL] [GM] [GN] [GO] [GP] [GQ] [GR] [GS] [GT] [GU] [GV] [GW] [GX] [GY] [GZ] [HA] [HB] [HC] [HD] [HE] [HF] [HG] [HH] [HI] [HJ] [HK] [HL] [HM] [HN] [HO] [HP] [HQ] [HR] [HS] [HT] [HU] [HV] [HW] [HX] [HY] [HZ] [IA] [IB] [IC] [ID] [IE] [IF] [IG] [IH] [II] [IJ] [IK] [IL] [IM] [IN] [IO] [IP] [IQ] [IR] [IS] [IT] [IU] [IV] [IW] [IX] [IY] [IZ] [JA] [JB] [JC] [JD] [JE] [JF] [JG] [JH] [JI] [JJ] [JK] [JL] [JM] [JN] [JO] [JP] [JQ] [JR] [JS] [JT] [JU] [JV] [JW] [JX] [JY] [JZ] [KA] [KB] [KC] [KD] [KE] [KF] [KG] [KH] [KI] [KJ] [KK] [KL] [KM] [KN] [KO] [KP] [KQ] [KR] [KS] [KT] [KU] [KV] [KW] [KX] [KY] [KZ] [LA] [LB] [LC] [LD] [LE] [LF] [LG] [LH] [LI] [LJ] [LK] [LL] [LM] [LN] [LO] [LP] [LQ] [LR] [LS] [LT] [LU] [LV] [LW] [LX] [LY] [LZ] [MA] [MB] [MC] [MD] [ME] [MF] [MG] [MH] [MI] [MJ] [MK] [ML] [MN] [MO] [MP] [MQ] [MR] [MS] [MT] [MU] [MV] [MW] [MX] [MY] [MZ] [NA] [NB] [NC] [ND] [NE] [NF] [NG] [NH] [NI] [NJ] [NK] [NL] [NM] [NO] [NP] [NQ] [NR] [NS] [NT] [NU] [NV] [NW] [NX] [NY] [NZ] [OA] [OB] [OC] [OD] [OE] [OF] [OG] [OH] [OI] [OJ] [OK] [OL] [OM] [ON] [OO] [OP] [OQ] [OR] [OS] [OT] [OU] [OV] [OW] [OX] [OY] [OZ] [PA] [PB] [PC] [PD] [PE] [PF] [PG] [PH] [PI] [PJ] [PK] [PL] [PM] [PN] [PO] [PP] [PQ] [PR] [PS] [PT] [PU] [PV] [PW] [PX] [PY] [PZ] [QA] [QB] [QC] [QD] [QE] [QF] [QG] [QH] [QI] [QJ] [QK] [QL] [QM] [QN] [QO] [QP] [QQ] [QR] [QS] [QT] [QU] [QV] [QW] [QX] [QY] [QZ] [RA] [RB] [RC] [RD] [RE] [RF] [RG] [RH] [RI] [RJ] [RK] [RL] [RM] [RN] [RO] [RP] [RQ] [RR] [RS] [RT] [RU] [RV] [RW] [RX] [RY] [RZ] [SA] [SB] [SC] [SD] [SE] [SF] [SG] [SH] [SI] [SJ] [SK] [SL] [SM] [SN] [SO] [SP] [SQ] [SR] [SS] [ST] [SU] [SV] [SW] [SX] [SY] [SZ] [TA] [TB] [TC] [TD] [TE] [TF] [TG] [TH] [TI] [TJ] [TK] [TL] [TM] [TN] [TO] [TP] [TQ] [TR] [TS] [TT] [TU] [TV] [TW] [TX] [TY] [TZ] [UA] [UB] [UC] [UD] [UE] [UF] [UG] [UH] [UI] [UJ] [UK] [UL] [UM] [UN] [UO] [UP] [UQ] [UR] [US] [UT] [UU] [UV] [UW] [UX] [UY] [UZ] [VA] [VB] [VC] [VD] [VE] [VF] [VG] [VH] [VI] [VJ] [VK] [VL] [VM] [VN] [VO] [VP] [VQ] [VR] [VS] [VT] [VU] [VV] [VW] [VX] [VY] [VZ] [WA] [WB] [WC] [WD] [WE] [WF] [WG] [WH] [WI] [WJ] [WK] [WL] [WM] [WN] [WO] [WP] [WQ] [WR] [WS] [WT] [WU] [WV] [WW] [WX] [WY] [WZ] [XA] [XB] [XC] [XD] [XE] [XF] [XG] [XH] [XI] [XJ] [XK] [XL] [XM] [XN] [XO] [XP] [XQ] [XR] [XS] [XT] [XU] [XV] [XW] [XX] [XY] [XZ] [YA] [YB] [YC] [YD] [YE] [YF] [YG] [YH] [YI] [YJ] [YK] [YL] [YM] [YN] [YO] [YP] [YQ] [YR] [YS] [YT] [YU] [YV] [YW] [YX] [YY] [YZ] [ZA] [ZB] [ZC] [ZD] [ZE] [ZF] [ZG] [ZH] [ZI] [ZJ] [ZK] [ZL] [ZM] [ZN] [ZO] [ZP] [ZQ] [ZR] [ZS] [ZT] [ZU] [ZV] [ZW] [ZX] [ZY] [ZZ]

Name	Text instruction (en-NL)	Image Instruction	Action
Filter...	Filter...	Filter...	Filter...
Root step			
Take Object t...	Pak toetsenbord uit gele...		Take Object
Activity toets...	Plaats toetsenbord in ge...		Activity
Place Object t...	Place toetsenbord		Place Object

Projector

+ New [X] [C] [D] [E] [F] [G] [H] [I] [J] [K] [L] [M] [N] [O] [P] [Q] [R] [S] [T] [U] [V] [W] [X] [Y] [Z] [AA] [AB] [AC] [AD] [AE] [AF] [AG] [AH] [AI] [AJ] [AK] [AL] [AM] [AN] [AO] [AP] [AQ] [AR] [AS] [AT] [AU] [AV] [AW] [AX] [AY] [AZ] [BA] [BB] [BC] [BD] [BE] [BF] [BG] [BH] [BI] [BJ] [BK] [BL] [BM] [BN] [BO] [BP] [BQ] [BR] [BS] [BT] [BU] [BV] [BW] [BX] [BY] [BZ] [CA] [CB] [CC] [CD] [CE] [CF] [CG] [CH] [CI] [CJ] [CK] [CL] [CM] [CN] [CO] [CP] [CQ] [CR] [CS] [CT] [CU] [CV] [CW] [CX] [CY] [CZ] [DA] [DB] [DC] [DD] [DE] [DF] [DG] [DH] [DI] [DJ] [DK] [DL] [DM] [DN] [DO] [DP] [DQ] [DR] [DS] [DT] [DU] [DV] [DW] [DX] [DY] [DZ] [EA] [EB] [EC] [ED] [EE] [EF] [EG] [EH] [EI] [EJ] [EK] [EL] [EM] [EN] [EO] [EP] [EQ] [ER] [ES] [ET] [EU] [EV] [EW] [EX] [EY] [EZ] [FA] [FB] [FC] [FD] [FE] [FF] [FG] [FH] [FI] [FJ] [FK] [FL] [FM] [FN] [FO] [FP] [FQ] [FR] [FS] [FT] [FU] [FV] [FW] [FX] [FY] [FZ] [GA] [GB] [GC] [GD] [GE] [GF] [GG] [GH] [GI] [GJ] [GK] [GL] [GM] [GN] [GO] [GP] [GQ] [GR] [GS] [GT] [GU] [GV] [GW] [GX] [GY] [GZ] [HA] [HB] [HC] [HD] [HE] [HF] [HG] [HH] [HI] [HJ] [HK] [HL] [HM] [HN] [HO] [HP] [HQ] [HR] [HS] [HT] [HU] [HV] [HW] [HX] [HY] [HZ] [IA] [IB] [IC] [ID] [IE] [IF] [IG] [IH] [II] [IJ] [IK] [IL] [IM] [IN] [IO] [IP] [IQ] [IR] [IS] [IT] [IU] [IV] [IW] [IX] [IY] [IZ] [JA] [JB] [JC] [JD] [JE] [JF] [JG] [JH] [JI] [JJ] [JK] [JL] [JM] [JN] [JO] [JP] [JQ] [JR] [JS] [JT] [JU] [JV] [JW] [JX] [JY] [JZ] [KA] [KB] [KC] [KD] [KE] [KF] [KG] [KH] [KI] [KJ] [KK] [KL] [KM] [KN] [KO] [KP] [KQ] [KR] [KS] [KT] [KU] [KV] [KW] [KX] [KY] [KZ] [LA] [LB] [LC] [LD] [LE] [LF] [LG] [LH] [LI] [LJ] [LK] [LM] [LN] [LO] [LP] [LQ] [LR] [LS] [LT] [LU] [LV] [LW] [LX] [LY] [LZ] [MA] [MB] [MC] [MD] [ME] [MF] [MG] [MH] [MI] [MJ] [MK] [ML] [MN] [MO] [MP] [MQ] [MR] [MS] [MT] [MU] [MV] [MW] [MX] [MY] [MZ] [NA] [NB] [NC] [ND] [NE] [NF] [NG] [NH] [NI] [NJ] [NK] [NL] [NM] [NO] [NP] [NQ] [NR] [NS] [NT] [NU] [NV] [NW] [NX] [NY] [NZ] [OA] [OB] [OC] [OD] [OE] [OF] [OG] [OH] [OI] [OJ] [OK] [OL] [OM] [ON] [OO] [OP] [OQ] [OR] [OS] [OT] [OU] [OV] [OW] [OX] [OY] [OZ] [PA] [PB] [PC] [PD] [PE] [PF] [PG] [PH] [PI] [PJ] [PK] [PL] [PM] [PN] [PO] [PP] [PQ] [PR] [PS] [PT] [PU] [PV] [PW] [PX] [PY] [PZ] [QA] [QB] [QC] [QD] [QE] [QF] [QG] [QH] [QI] [QJ] [QK] [QL] [QM] [QN] [QO] [QP] [QQ] [QR] [QS] [QT] [QU] [QV] [QW] [QX] [QY] [QZ] [RA] [RB] [RC] [RD] [RE] [RF] [RG] [RH] [RI] [RJ] [RK] [RL] [RM] [RN] [RO] [RP] [RQ] [RR] [RS] [RT] [RU] [RV] [RW] [RX] [RY] [RZ] [SA] [SB] [SC] [SD] [SE] [SF] [SG] [SH] [SI] [SJ] [SK] [SL] [SM] [SN] [SO] [SP] [SQ] [SR] [SS] [ST] [SU] [SV] [SW] [SX] [SY] [SZ] [TA] [TB] [TC] [TD] [TE] [TF] [TG] [TH] [TI] [TJ] [TK] [TL] [TM] [TN] [TO] [TP] [TQ] [TR] [TS] [TU] [TV] [TW] [TX] [TY] [TZ] [UA] [UB] [UC] [UD] [UE] [UF] [UG] [UH] [UI] [UJ] [UK] [UL] [UM] [UN] [UO] [UP] [UQ] [UR] [US] [UT] [UU] [UV] [UW] [UX] [UY] [UZ] [VA] [VB] [VC] [VD] [VE] [VF] [VG] [VH] [VI] [VJ] [VK] [VL] [VM] [VN] [VO] [VP] [VQ] [VR] [VS] [VT] [VU] [VV] [VW] [VX] [VY] [VZ] [WA] [WB] [WC] [WD] [WE] [WF] [WG] [WH] [WI] [WJ] [WK] [WL] [WM] [WN] [WO] [WP] [WQ] [WR] [WS] [WT] [WU] [WV] [WW] [WX] [WY] [WZ] [XA] [XB] [XC] [XD] [XE] [XF] [XG] [XH] [XI] [XJ] [XK] [XL] [XM] [XN] [XO] [XP] [XQ] [XR] [XS] [XT] [XU] [XV] [XW] [XX] [XY] [XZ] [YA] [YB] [YC] [YD] [YE] [YF] [YG] [YH] [YI] [YJ] [YK] [YL] [YM] [YN] [YO] [YP] [YQ] [YR] [YS] [YT] [YU] [YV] [YW] [YX] [YY] [YZ] [ZA] [ZB] [ZC] [ZD] [ZE] [ZF] [ZG] [ZH] [ZI] [ZJ] [ZK] [ZL] [ZM] [ZN] [ZO] [ZP] [ZQ] [ZR] [ZS] [ZT] [ZU] [ZV] [ZW] [ZX] [ZY] [ZZ]

Edit Step Edit Master  
 [Left Arrow] [Up Arrow] [Down Arrow] [Right Arrow]

Local (ARCTEPC)  
 X (mm) [0] Y (mm) [0] Z (mm) [0] Roll (mm) [0] Pitch (mm) [0] Alt (mm) [0] [Reset zoom]

Properties

Detection step

Name: ID: 166000041621648

Place Object toetsenbord

Step instructions

Image instruction

en-NL

Place toetsenbord

De laatste stap is nu ook toegevoegd!

Leg toetsenbord terug op plaats



En ook deze wordt  
geprojecteerd op je tafel!

Bij deze is de instructie al  
aangepast: niet vergeten  
zelf te doen!

Edit: Properties, Versions, Restart, Record, Auto Record, Recordings  
 Project Global: Variables, Conditions, Variants, Images, Materials, Tasks, Instructions, Experience Level, Color Templates, Maintenance, Log Tables  
 Workstation: Properties Panel, Show all displays, Search, Help

Detections Processes Connectivity Tasks

Processes

+ Add Process

Process Name

Process

Start / pause the selection

Om je proces te testen, druk je op het groene pijltje.

Steps

Columns Variants and Conditions Instructions None

Go To Auto detect

Name	Text instruction (en-NL)	Image Instruction	Action
Filter...	Filter...	Filter...	Filter...
Root step			
Take Object t...	Pak toetsenbord uit gele...		Take Object
Activity toets...	Plaats toetsenbord in ge...		Activity
Place Object t...	Leg toetsenbord terug o...		Place Object

Start Location Show Edit Step Edit Master

Text Instructions

Local (ARKITEPC)

X (mm) Y (mm) Z (mm) Rot (mm) Reset zoom

Detection step

Name: id: 14602644231647

Place Object toetsenbord

Step instructions

Image instruction

en-NL

Leg toetsenbord terug op plaats

# En zo programmeer je processen!

Nu weet je hoe je jouw eigen processen kan maken en doorlopen.

# Wat is belangrijk voor programmeren?

Programmeren van processen kan een vrij complexe uitdaging zijn.

Ook zijn er valkuilen en belangrijke factoren, die het uitwerken ervan moeilijk kunnen maken als je er niet op let.

Op de volgende dia's is een overzicht van kernpunten om op te letten.

# Wat is belangrijk voor programmeren?

**Vraag wat medewerkers prettig vinden, en nodig hem uit om het zelf te proberen**

Je maakt een proces voor de mensen die het gaan gebruiken. Om die reden is het verstandig om hen zo vroeg mogelijk te betrekken bij de ontwikkeling.

Vinden ze de tekst groot genoeg? Willen ze de werkplaats anders inrichten? Zijn er andere zaken waar zij waarde aan hechten?

# Wat is belangrijk voor programmeren?

- Vraag wat medewerkers prettig vinden, nodig hem uit om het zelf te proberen
- Vraag waar complexiteit zit in het proces
- Vraag of zij het logisch opgesteld vinden, logisch geordend vinden
  
- Eigenlijk HCD-lite: TINT unique selling point omdat we het menselijke aan het technische koppelen

# Wat is belangrijk voor programmeren?

## **Vraag waar complexiteit zit in het proces**

De moeilijkste stappen in het werkproces vereisen de meeste ondersteuning. Door goed te weten wat het moeilijkst is, kun je hierop inspelen.

Moet bij de moeilijkste stap bijvoorbeeld een extra tussenstap qua uitleg? Wil een medewerker meer beeld of een video-uitleg erbij?

# TINT Apeldoorn & OSS programmeren

## Ondersteuning van TINT Apeldoorn

- Als TINT Apeldoorn denken we graag met je mee over wat kan en wat past.
- Niet alleen binnen jouw werkprocessen, maar ook bij jouw bedrijfscultuur.
- Ook kunnen we studentonderzoekers laten meedraaien binnen jouw organisatie voor een langere periode.
- Zo heb je *in-depth* informatie én ondersteuning op locatie!

# Terugkoppeling leerdoelen

Door het volgen van deze module:

Na het volgen van deze module:

- Weet je wat processen zijn
- Kun je processen zelf programmeren
- Ben je bewust van waarop je moet letten bij programmeren

# Arkite Operator Support System (OSS)

Les 5: Programmeren van processen