

Nuevas técnicas de automatización industrial S.L.

February 22nd,2024 RECDrive User Manual

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Overview



- 1 Introduction
- 2 Specifications
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Overview



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Introduction



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What is RECDrive?

RECDrive is a hardware and software solution, which allows the activation of the *freeDrive* mode without the use of the *teach pendant*. It also allows the capture of the robot's trajectory.

Available with two working modes, manual or automatic. The software allows different parameters to be configured for customised point capture, such as the point capture time or the radius between points.

င်္ဂြိ Possible applications

• Use free movement

• Compatibility with any gripper

- Point capture
- Path capture

Warning: we are not responsable for damage caused by misuse of this producto. An e-series robot is used in this manual, the software is not compatible with the CB series.

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Specifications



This section explains everything related to the product specifications. It is divided into the following subsections:

1. Hardware

Specifications with respect to mechanical design.

2. Software

URCap software specifications.

Specifications





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Specifications

RECDrive product hardware specifications:

- Dimensions: W=85mm, L=85mm, H=46,5mm
- Weight: 212 grams
- Connectors M8 male and female
- Push button



46,5







Specifications



Mechanical compatibility:

- UR3e / CBSeries
- UR5e / CBSeries
- UR10e / CBSeries
- UR16e

Connector compatibility:

- UR3e / CBSeries
- UR5e / CBSeries
- UR10e / CBSeries
- UR16e

Specifications





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Specifications

RECDrive Product Software Specifications:

- Point-to-point trajectory saving.
- Continuous trajectory capture.
- Input configuration for free movement.
- Setting of capture time period in automatic mode.
- Radius setting for transition between movements.

Specifications





RECDrive Product Software Specifications:

• CB series

-No compatible

- E- series
 - UR3e: Polyscope 5.5.1 and above.
 - UR5e: Polyscope 5.5.1 and above.
 - UR10e: Polyscope 5.5.1 and above.
 - UR16e: Polyscope 5.5.1 and above.
 - UR20e: Polyscope 5.15.1 and above.
 - UR30e: Polyscope 5.15.1 and above.

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This section will explain how to configure the UR robot to use free motion mode. The UR setup node is presented below.

Ejecutar Programa		PROGRAMA <sin nombre=""></sin> INSTALACIÓN default*	Nuevo Abrir Guardar	
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Montaje	Entrada		Salida	
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E/S de herram.	DI[2] digital_in[2]		D0[2] digital_out[2]	
Variables	Di[4] digital_in[4]		D0[4] digital_out[4]	
Arranque	DI[6] digital_in[6]		D0[6] digital_out[6]	
Transición fluida	DI[7] digital_in[7]		DO[7] digital_out[7]	
Origen	Ti[1] tool_in[1]	~	TO[1] tool_out[1]	\checkmark
Seguimiento de cinta tra	E/S seleccionada: tool_in[1]			
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🔪 Seguridad		Borrar		
> Funciones				
Bus de campo	Acción			
> URCaps	Ninguno	•		
Apagar	Velocidad 🥌	100%		Simulación

The default input shall be tool_int[1].

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To use the free motion, the desired input must be associated with the free motion function of the robot. Available inputs (
)

Ejecutar Programa Instalación	Hover E/S Registro	PROGRAMA <sin nombre=""></sin> INSTALACIÓN default*	Nuevo Abrir Guardar	
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Carga				
Montaje	Entrada		Salida	
Config. E/S	DI[0] digital_in[0] DI[1] digital_in[1]	^	DO[0] digital_out[0] DO[1] digital_out[1]	^
E/S de	DI[2] digital_in[2]		D0[2] digital_out[2]	
herram.	DI[3] digital_in[3]		DO[3] digital_out[3]	
Variables	DI[4] digital_in[4]		DO[4] digital_out[4]	
Arranque	DI[5] digital_in[5]		DO[5] digital_out[5]	
Transición	DI[7] digital_in[7]		DO[7] digital_out[7]	
fluida	TI(0) tool in(0)		T0101 tool out101	
Origen	TI[1] tool_in[1]	~	TO[1] tool_out[1]	~
Seguimiento de cinta tra	E/S seleccionada: tool_in[1]			
Atornillado	Cambiar nombre			
> Seguridad		Borrar		
> Funciones				
Bus de campo	Acción			
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	-			
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() Action associated with selected input.



Once configured, the selected function will be observed at the input(

Ejecutar Programa Instalación	Hover E/S Registro	PROGRAMA < s Instalación de i	in nombre>* fault*	Nuevo	Abrir Guardar	
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Config. E/S	DI[0] digital_in[0] DI[1] digital_in[1]		^	D0[0] D0[1]	digital_out[0] digital_out[1]	^
E/S de herram.	DI[2] digital_in[2] DI[3] digital_in[3]			D0[2] D0[3]	digital_out[2] digital_out[3]	
Variables	DI[4] digital_in[4]			D0[4]	digital_out[4]	
Arranque	DI[6] digital_in[6]			D0[6]	digital_out[6]	
Transición fluida	DI[7] digital_in[7]			D0[7]	digital_out[7]	
Origen	TI[0] tool_in[0]	Freedrive	~ ~	TO[0]	tool_out[0]	~
Seguimiento de cinta tra	E/S seleccionada: tool_in[1]				
Atornillado	Cambiar nombre					
> Seguridad		Bor	rar			
> Funciones						
> Bus de campo	Acción					
> URCaps	Movimiento libre	▼				
O Normal	Velocio	lad Caracteria	100%	C	00	Simulación

(**D**) Free movement selected.



The internal connections used by the hardware are presented below:

UR	GRIPPER
GND	GND
VCC	VCC
DO0	DO0
DO1	DO1
DIO	DIO
DI1	Switch free Drive
AIO	AIO
AI1	AI1

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This section explains everything related to the functionalities of the URCap software. It is divided into the following subsections:

1. Programme Panel

Configuration of work mode parameters.

2. Installation Panel

Configuration of general sequence parameters.







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This section explains everything related to the functionalities of the URCap software found in the programme node.

Run Program Installation		PROGRAM <unname< b=""> ALLATION default*</unname<>	d>* 😭 📑		∷ •∕∎
> Basic	٩	Command	Graphics	Variables	
> Advanced > Templates	1 ▼ Robot Program	RECDrive			
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RECDrive			REC Drive	•	Anutai
		Configuration			•
ৰ			1		
		Mode Period (ms) Radius	Manual 1000	_]	
	▲ ➡ つ ♂ ¥ ▣ ▤ 茴 ⊒	i State:	waiting		Capture
Power off	Speed	100%			Simulation



You can change the name of the programme node for better identification via the pop-up keyboard.

Run Program Installation		PROGRAM <unname< b=""> ALLATION default*</unname<>	d>* 🚺 🏳 New Oper		
> Basic	٩	Command	Graphics	Variables	
> Advanced> Templates	1 ▼ Robot Program 2 ♥ ▼ RECDrive	RECDrive			
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tidyPal		Information			
RECDrive			REC Drive	е	🔄 nutai
		Configuration	n		
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		Radius			
	▲ ╄ つ ♂ X @ @ @ @ ⊒	i State:	waiting		Capture
Power off	Speed Contraction	100%	D	00	Simulation

(**D**) Programme node name.



You can choose between two working modes: manual or automatic mode. In manual mode, the required points are captured by double-clicking the push button available on the hardware. (

Run Program Installation		PROGRAM <unnamed>* 🔓 📑 🖬 TALLATION default* New Open Save</unnamed>
> Basic	٩	Command Graphics Variables
 > Advanced > Templates 	1 ▼ Robot Program 2 • ▼ RECDrive	RECDrive
✔ URCaps	3 - empty>	Enter the text to be displayed in the programme tree.
MAD CPOS		
tidvPal		Information
RECDrive		OREC Drive 🚱 nutai
		Configuration
		Mode Manual Period (ms) 1000 Radius
	↑ ↓ 	i State: waiting Capture
Power off	Speed	100% () () Simulation

(**D**) URCap and company logos.



In automatic mode, you will also set the time period when you want to add a new point to the trajectory. The software will start capturing once the button is activated. (□)

Run Program Installation		PROGRAM <unname< b=""> FALLATION default*</unname<>	d>* 🔒 📑	. Save	
> Basic	٩	Command	Graphics	Variables	
 > Advanced > Templates 	1 ▼ Robot Program 2 \$\mathbf{v}\$ ▼ RECDrive	RECDrive			
VURCaps MAD CPOS	3 empty>	Enter the text to	be displayed in the	programme tre	ee.
MAD MOVE		Information			
RECDrive			REC Drive	;	🚱 nutai
ન		Configuration	ı		
		Mode Period (ms) Radius	Manual	▼	
	▲ ╄ ゔ ♂ ₭ 個 箇 面 ञ	i State:	waiting		Capture
Power off	Speed	100%			Simulation



The points obtained during the capture can be configured to add a radius between the transitions of the movements. This way the robot will make a continuous movement without stopping at each point.

Run Program Installation		PROGRAM <unnamed>* 📮 🛅 🖬 Tallation default* New Open Save</unnamed>
> Basic	Q	Command Graphics Variables
> Advanced> Templates	1 ▼ Robot Program 2 ♥ ▼ RECDrive	RECDrive
V URCaps	3 - empty>	Enter the text to be displayed in the programme tree.
MAD CPOS		Information
tidyPal RECDrive		ORECDrive 🚱 nutai
		F Configuration
		Mode Manual Period (ms) 1000 Radius
	▲ ╄ ゔ ♂ 米 빌 箇 面 ⊒	State: waiting Capture
Power off	Speed 🥌	100% () () Simulation



The status of the trajectory capture can be observed at any time.

Run Program Installation		PROGRAM <unname< b="">d TALLATION default*</unname<>	d>* 🔓 🖻	n Save	
> Basic	Q	Command	Graphics	Variables	
 > Advanced > Templates 	1 ▼ Robot Program 2 ♀ ▼ RECDrive	RECDrive			
	3 empty>	Enter the text to	be displayed in th	ne programme tre	ee.
MAD CPOS		Information			
tidyPal RECDrive			REC Driv	e	🚱 nutai
		Configuration	I		
		Mode Period (ms) Radius	Manual	_	
	▲ ♥ ♥ ♥ ¥ ■ ඕ ඕ ⊒	State:	waiting		Capture
Power off	Speed 🥌	100%	D		Simulation

(**D**) An information icon is displayed

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When you click on the info icon (1), a pop-up with information will appear.





Once the different parameters have been configured, the Capture button must be pressed to start capturing points. (

Run Program Installation		PROGRAM <unname< b=""> TALLATION default*</unname<>	id>* 🔒 📄	Save	
〉 Basic	۹	Command	Graphics	Variables	
 > Advanced > Templates 	1 ▼ Robot Program 2 ♥ ▼ RECDrive	RECDrive			
✔ URCaps	3 <empty></empty>	Enter the text to	be displayed in th	e programme ti	ee.
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RECDrive				e	🚱 nutai
4	0	Configuratio	n		
					•
		Mode	Manual	▼	
		Period (ms)	1000		<pre></pre>
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O Normal	Speed Contraction	100%			Simulation



Each time a point is captured in manual mode, the gasket on the robot icon will light up to indicate that a new point has been added. (

Run Program Installation		PROGRAM <unname< b=""> TALLATION default*</unname<>	d>*		
> Basic	۹	Command	Graphics	Variables	
> Advanced> Templates	1 ▼ Robot Program 2 ♥ ▼ RECDrive	RECDrive			
✓ URCaps	3 ♥	Enter the text to	be displayed in th	e programme tr	ee.
MAD CPOS					
MAD MOVE		Information			
BECDrive			REC Drive	е	Anutai
in control					•
•			ו		
		Mode	Manual		
		Period (ms)	1000		()
		Radius			
	▲ ♥ ゔ ♂ ೫ 빌 箇 面 ⊒	i State:	capturing	۲	Capturing
Normal	Speed Caracteria	100%	D	$\bigcirc \bigcirc$	Simulation



In automatic mode, the software will periodically add new points to the trajectory, as long as the push button is pressed and the points are not too close to each other.

Run Program Installation		PROGRAM <unname< b=""> ALLATION default*</unname<>	:d>* 1	n Save	
> Basic	٩	Command	Graphics	Variables	
 > Advanced > Templates 	1 ▼ Robot Program 2 ♥ ▼ RECDrive	RECDrive			
MAD CPOS	4 O WayPoint 5 O WayPoint_1 6 O WayPoint_2 7 O WayPoint_3 8 O WayPoint_4	Enter the text to be displayed in the programme tree.			
tidyPal		Information			
RECDrive	9 O WayPoint_5 10 O WayPoint_6		OREC Driv	е	nutai
	11 WayPoint_7	Configuration			
		Mode	tool_in[1]	▼	
		Period (ms)	1000		er a 🤇
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Normal	Speed Contraction	100%	D		Simulation









This section explains everything related to the functionalities of the URCap software found in the installation node.





Any digital input of the controller or digital input of the tool can be configured to perform the point capture. For our mechanical design, input 1 of the tool (
) will be used.



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Best practices



Me advise you to follow the recommendations below:

- Before starting a cycle, check that there is no risk of collision.
- The components may only be handled by qualified technical personnel.
- During a cycle, position the teach pendant in the cabinet.
- Carry out regular and correct maintenance of your mechanical components.

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Support



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