Linear axes for collaborative robots
Heritage of innovation for technology leadership

Ewellix is a global innovator and manufacturer of linear motion and actuation solutions. Today, our state-of-the-art linear solutions are designed to increase machine performance, maximise uptime, reduce maintenance, improve safety and save energy.

Technology leadership
Our journey began over 50 years ago as part of the SKF Group, and our history with SKF provided us with the expertise to continuously develop new technologies and use them to create cutting edge products that offer our customers a competitive advantage.

In 2019, we became independent from SKF and changed our name to Ewellix. We are proud of our heritage. This gives us a unique foundation on which to build an agile business with engineering excellence and innovation as our core strengths.

Global presence and local support
With our global presence, we are uniquely positioned to deliver standard components and custom-engineered solutions, with full technical and applications support around the world. The long lasting relationships with our distributor partners allow us to support customers in a variety of different industries. At Ewellix, we don’t just provide products; we engineer integrated solutions that help customers realise their ambitions.
Collaborative robots (cobots) can greatly improve productivity in industrial environments with repetitive tasks. The radius of action is usually limited by their reach. Additional linear axes can significantly enhance the radius of action up to 5 times, by re-positioning the base of the robot during its working cycle.

Ewellix offers a range of linear motion axes - vertical and horizontal - to easily expand the capabilities of a cobot.

**Benefits for palletizing**

Fully automated pick and place solutions are becoming a new standard with packaging stations. The main challenge for packaging system manufacturers is to design multi-axis systems in a simple and cost effective way. A typical application that benefits from an added linear axis is palletizing of boxes. Stacking on pallets can start at floor level, but the stack can be up to 2 m high. A standard collaborative robot does not have such a large vertical working range.

Ewellix provides effective solutions to complete vertical adjustment in a smart way, providing a ready to mount additional linear axis to the robot. While stacking a pallet, the base of the robot can be lifted or lowered to work at a more optimal position.

**Benefits for handling**

Concerning handling applications, it’s often required to cover long distances between machines, like machined parts loading and unloading on CNC centers.

This repetitive operation, usually done manually, is time consuming and with low added value for the operators.

By using a cobot on the Ewellix linear module, it is possible to easily automate this handling process, increasing its productivity and reliability.

Linear modules from Ewellix provide fast and precise movements to effectively position the robot along a horizontal axis.
Solutions for vertical axes

Ewellix offers different telescopic pillar configurations to meet the demands of a range of cobot applications. These telescopic pillars are very robust and stable, with built in drive system for easy integration.

TLT

- Telescopic design using two motors to achieve a high stroke with low retracted height
- Fast speed up to 80 mm/s at 1500 N push load
- Very quiet operation
- Mechanical brake included
- Different screw and motor options

CPMT

- Telescopic design using a double screw drive train to achieve a high stroke with low retracted height
- Higher duty cycle and lifetime compared to TLT
- Single motor design
- Push and pull load
CPSM

- Servo pillar with full motor flexibility
- Can be provided with external brushless DC or servo motor, or interface for any third party motor
- Very high speeds over 200 mm/s
- Highest duty cycle and lifetime
- Push and pull load

Key benefits for collaborative robots

<table>
<thead>
<tr>
<th>Main application</th>
<th>Push/pull force</th>
<th>Positioning precision</th>
<th>Duty cycle</th>
<th>Brake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palletizing</td>
<td>Push</td>
<td>0,3 mm</td>
<td>Low</td>
<td>Internal</td>
</tr>
<tr>
<td>Ceiling mounting</td>
<td>Push/pull force</td>
<td>0,2 mm</td>
<td>Medium</td>
<td>Internal</td>
</tr>
<tr>
<td>Pick and place</td>
<td>Push and pull</td>
<td>0,1 mm</td>
<td>High</td>
<td>External</td>
</tr>
</tbody>
</table>

CPSM

• Servo pillar with full motor flexibility
• Can be provided with external brushless DC or servo motor, or interface for any third party motor
• Very high speeds over 200 mm/s
• Highest duty cycle and lifetime
• Push and pull load

* with customization
Solutions for horizontal axes

Ewellix offers different linear module configurations to meet the demands of a range of horizontal cobot positioning applications.

CLSM-150-B

Features
- Ball screw drive train (belt drive train on request)
- Four cover option for different protection levels
- High level of positioning precision and repeatability
- Inline and parallel gear boxes
- Customized motor adapter plate to fit any motor
- Stroke up to 1.8 m (longer strokes available on request)
- Speed up to 1.2 m/s (higher speed on request)

Benefits
- High movable loads in operation
- Long life in operation
- Easy maintenance by one-point lubrication option from both carriage sides
- Precise alignment and secure fastening of the attachments
Customized solutions

Ewellix offers a wide range of possible customizations to satisfy different application needs.

From basic modifications like custom attachments or painting to complete customized solution, Ewellix can offer tailor made systems to empower cobots users in getting most benefits for their applications.

In this customization example, we have realized a multi-axes system to move independently 2 robots on both horizontal and vertical axes, dramatically enlarging the operating range while keeping a very compact footprint.

Features
- Rack and pinion drivetrain
- Independent movement
- Stroke up to 6m
- Multiple carriages
- Custom cobot mounting plates
Integrated solutions for Universal Robots

Complete plug & play solutions, UR+ certified, are available for cobots from Universal Robots. The LIFTKIT and SLIDEKIT provide a ready-to-install solution to easily add a vertical or horizontal axis to Universal Robots.

The kits include all required hardware, controllers and interfaces to the Universal Robots system. Also included is a URCaps software to directly control the additional axis from within the UR programming environment. No engineering resources needed! Ready to run in 30 minutes.

**LIFTKIT**

Connection diagram

**SLIDEKIT**

Connection diagram
Linear axis for collaborative robots LIFTKIT

Operating range extension
- Vertical lifting of the cobot by up to 900 mm with compact retracted height
- Robust pillar design for industrial use, vibration free motion and virtually maintenance free

Plug-and-play solution
- Hardware interface compatible with UR3, UR5 and UR10 robots
- Universal Robots+ certified product
- Software control integrated with UR controller (URCaps) for easy motion programming

Cost savings and higher productivity
UR cobots combined with Ewellix LIFTKIT provide a cost-effective solution to upgrade an existing assembly shop, moving from a manual handled to a fully automatized line.

Technical data

<table>
<thead>
<tr>
<th>Mechanical</th>
<th>Unit</th>
<th>LIFTKIT-UR-601</th>
</tr>
</thead>
<tbody>
<tr>
<td>Push load</td>
<td>N</td>
<td>1 500 N</td>
</tr>
<tr>
<td>Pull load</td>
<td>N</td>
<td>0 N</td>
</tr>
<tr>
<td>Speed</td>
<td>mm/s</td>
<td>80 mm/s</td>
</tr>
<tr>
<td>Stroke</td>
<td>mm</td>
<td>500 – 900 mm</td>
</tr>
<tr>
<td>Retracted length (hardware)</td>
<td>mm</td>
<td>Stroke/2 + 265 mm</td>
</tr>
<tr>
<td>Retracted length (software controlled)</td>
<td>mm</td>
<td>Stroke/2 + 275 mm</td>
</tr>
<tr>
<td>Height of attachment plates</td>
<td>mm</td>
<td>2x15 mm</td>
</tr>
<tr>
<td>Cross section</td>
<td>mm</td>
<td>163 mm x 163 mm</td>
</tr>
<tr>
<td>Type of protection</td>
<td>IP</td>
<td>40</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>°C</td>
<td>+10 to +40 °C</td>
</tr>
<tr>
<td>Compatibility to UR</td>
<td></td>
<td>UR3, UR5, UR10, e-Series</td>
</tr>
<tr>
<td>Cable management</td>
<td></td>
<td>Threads on pillar and interface plate to attach cable management</td>
</tr>
</tbody>
</table>

| Electrical          | V/A  | 120 AC / 6.5                    |
|                    |      | 230 AC / 3,3                    |
|                    |      | 24 DC / 10                      |
| Emergency stop      |      | Connection to UR safety IO      |

| Software functionality | mm | ± 1 mm                         |
|                       |    | any                            |
| Positioning, repeatability |    | Position feedback via URCaps   |
| Accessible positions  |    | Implemented for smooth operation |
| Feedback              |    |                                |
| Soft start and stop   |    |                                |
| Universal Robots controller compatibility |    | CB 3.1 / Polyscope 3.6 or higher |
**Dimensional drawing**

**TLT telescopic pillar**

![Dimensional drawing of a TLT telescopic pillar]

**Control unit**

![Control unit diagram]

**LIFTKIT contains**

- UR attachment plate
- Bottom fixation plate
- Cables and screws
- Operating manual
- Handswitch
- Controller
- UR software plugin
- Teach pendant

*Teach pendant not included

**Ordering key**

<table>
<thead>
<tr>
<th>LIFTKIT - UR - 00</th>
</tr>
</thead>
</table>

**Robot**

- UR Universal Robots

**Stroke**

- 500 mm
- 600 mm
- 700 mm
- 800 mm
- 900 mm

**Electrical options**

- 00 24 V DC
- 11 120 V AC / US cable
- 22 230 V AC / EU cable
- 23 230 V AC / CN cable
- 24 230 V AC / UK cable
- 25 230 V AC / CH cable

**Pillar type**

- 601 TLT
Operating range extension
By adding a linear module as a dynamic base for the robot, it is possible to extend the handling operating area of the robot, increasing the productivity of a series of machines working in the same production flow.

Plug-and-play solution
The SLIDEKIT provides quick and fast installation, by having a standardized mechanical, electrical and software interface with Universal Robots. In few steps, the system is ready to be used and simply programmed in operation.

Cost savings and higher productivity
UR cobots combined with the SLIDEKIT linear module provide a cost-effective solution to upgrade an existing assembly shop, moving from a manual handled to a fully automated line.

Technical data

<table>
<thead>
<tr>
<th>Performance data</th>
<th>Unit</th>
<th>SLIDEKIT-UR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. dynamic load</td>
<td>N</td>
<td>21 000</td>
</tr>
<tr>
<td>Max. dynamic moments</td>
<td>Nm</td>
<td>2 400</td>
</tr>
<tr>
<td>Stroke</td>
<td>mm</td>
<td>100...1 800</td>
</tr>
<tr>
<td>Max. speed</td>
<td>mm/s</td>
<td>1 200</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>%</td>
<td>100</td>
</tr>
<tr>
<td>Screw lead</td>
<td>mm</td>
<td>05 or 10 or 20</td>
</tr>
<tr>
<td>Repeatability</td>
<td>mm</td>
<td>0,01</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>°C</td>
<td>0 to +50</td>
</tr>
<tr>
<td>Max. humidity</td>
<td>%</td>
<td>95</td>
</tr>
</tbody>
</table>

| Electrical data           | V AC / A | 120 to 240 / 6,5 to 3,3 |

<table>
<thead>
<tr>
<th>Software functionality</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmable positions</td>
<td>–</td>
<td>10</td>
</tr>
<tr>
<td>Access to position via UR Caps</td>
<td>–</td>
<td>yes</td>
</tr>
<tr>
<td>Speed adjustable</td>
<td>–</td>
<td>yes</td>
</tr>
<tr>
<td>Universal Robots controller compatibility</td>
<td>–</td>
<td>CB 3.1 / Polyscope 3.6 or higher</td>
</tr>
</tbody>
</table>
Dimensional drawing

Control unit

NOTE.
Side brackets for rack mounting are provided with the control box but are not pre-mounted

SLIDEKIT contains

- Teach pendant not included
- UR attachment plate
- UR software plugin
- Cableveyor
- CLSM Linear module
- Control unit
- Servomotor
- Cables

Ordering key

SLIDEKIT - UR - 0 - 0 - 0

Robot
UR Universal Robots

Module options
B Ball screw
05 Lead
10 Lead
20 Lead
A Cover Aluminum
P Cover PU-Strip
S Cover Steel

Stroke
100 ... 1.800 mm

Electrical options
11 120 VAC / US cable
22 230 VAC / EU cable
23 230 VAC / CN cable
24 230 VAC / UK cable
25 230 VAC / CH cable

Accessories options
0 No limit switches
S Limit switches
0 No cableveyor
C Cableveyor
Software functionality

The URCaps software for the LIFTKIT and SLIDEKIT allows easy positioning access directly within the UR Polyscope environment.

Setup
In the installation tab, the user can move the linear axis in both directions manually and define multiple user specific positions, that are accessible in programming mode.

Motion programming
Within the UR motion program, the LIFTKIT and SLIDEKIT axes are easily integrated through a URCaps command module. Simply insert this element from the structure tab at the desired position of the program.

Safety elements
The LIFTKIT and SLIDEKIT have a range of safety elements built in to allow their integration into a collaborative robot application.

LIFTKIT
- The LIFTKIT pillar has an integrated mechanical brake that prevents back-driving in case of power loss or motor failure
- A backup nut is installed to prevent a collapse of the pillar in case of failure or wear of the nut
- Pinching risk between the tube sections of the pillar and the UR attachment plate is minimized
- The LIFTKIT controller has to be connected to the UR safety IO to operate. Activation of the UR emergency stop will trigger a stop of the controller. If the UR system is turned off, the LIFTKIT cannot be operated
- The LIFTKIT controller and the URCaps software have mechanisms to monitor the integrity of the connection, and stop motion in case of failure

SLIDEKIT
- Pinching risk between the carriage and each end block of the SLIDEKIT is minimized
- The SLIDEKIT controller has to be connected to the UR safety IO to operate. Activation of the UR emergency stop will trigger a stop of the controller. If the UR system is turned off, the SLIDEKIT cannot be operated
- The SLIDEKIT controller and the URCaps software have mechanisms to monitor the integrity of the connection, and stop motion in case of failure

NOTE:
LIFTKIT and SLIDEKIT are not functional safety systems compliant with EN ISO 13489-1 or IEC 62061. To integrate the LIFTKIT and SLIDEKIT into a functional safety chain, external safety devices have to be integrated into the overall system.
For more information please visit www.ewellix.com to download technical datasheets and operating manuals.