

# TELEROBOTICS EXTENDER AKA TREX

## COTS-BASED APPROACH = COST-EFFECTIVE SOLUTION

Haption's force-feedback devices can be used to control robots manually from a distance, in an intuitive manner. The operators are removed from the dangerous zone and still keep their dexterity and can make full use of their manual skills without the need for programming. Thanks to the force-feedback, they are able to monitor the forces applied by the robots to their environment, thus reducing the risks of damage.



# Remote handling    # Telemaintenance    # Robotics

### FUNCTIONALITIES

#### TREX VERSION 1.0 & 1.1

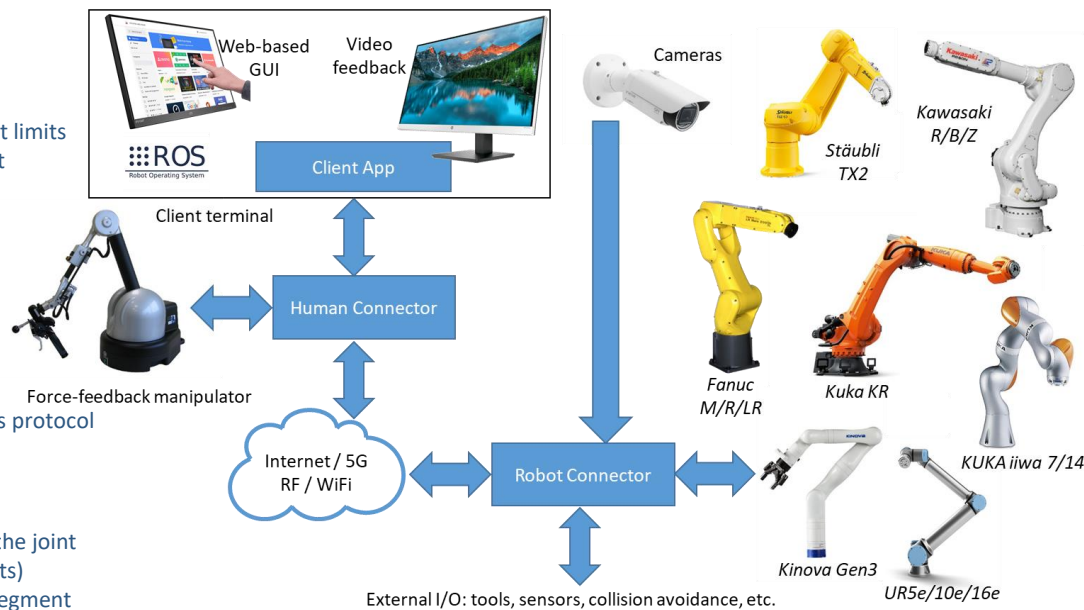
- ✓ Bilateral control with force-feedback
- ✓ Type of feedback:
  - Dynamic feedback: inertia, drag, joint limits
  - Interactive feedback: weight, contact
- ✓ Clutching in translation and rotation
- ✓ Adjustable base rotation
- ✓ Adjustable force and movement scaling
- ✓ Smooth transition between control modes
- ✓ High level of safety
- ✓ Full data streaming over Ethernet/UDP
- ✓ Virtual fixtures
- ✓ Internal collision prevention
- ✓ Secure, high-performance communications protocol
- ✓ Multi-lingual Graphical User Interface

#### TREX VERSION 1.2

- ✓ Possibility for the site manager to change the joint limits of the robot (within the physical limits)
- ✓ Viewpoint of camera attached to a robot segment
- ✓ Internal collision prevention
- ✓ Limitation of robot movement with a bounding box (still under development)
- ✓ Support of Staubli TX2 robots (160, 90, 40) with uniVAL Drive
- ✓ Possibility to duplicate an existing coupling configuration
- ✓ Adjustable gripper rotation speed
- ✓ Adjustable joint motion speed
- ✓ Cartesian translation motion with sliders
- ✓ Display of communication latency between TREX Boxes
- ✓ Joint and Cartesian control via gamepad
- ✓ Support of WiFi 6 transport between two TREX Boxes
- ✓ Support of external force/torque sensor ATI/Schunk Axia80
- ✓ Support of standalone Robotiq gripper
- ✓ Cartesian constraints in the tool reference frame
- ✓ Different force scaling for translations and rotations
- ✓ Support for Dark mode in Control GUI

Beside our hardware products, we provide software modules and technical expertise for the implementation of telerobotic applications.

### The TREX Vision



Robot vendors	Models	Prerequisites
FANUC	LR Mate, M & R Series (*)	Controller R30iBPlus running software v9.30 P13 with RAM upgrade
Kawasaki Robotics	RS, BX, MS Series (*)	Controllers F60, E01, E02
Kinova	Gen3	None
KUKA	LBR iiwa 7 R800 LBR iiwa 14 R820	KUKA Sunrise 1.16 or newer with FRI and GripperToolbox
	KR (*)	KUKA.RobotSensorInterface
Stäubli	TX2 (*)	Controller CS9 with uniVAL Drive 2
Universal Robots	URe Series	Polyscope 5.9 or newer

(\*) Requires an intervention of our personnel on the specific robot model, quoted separately

#### SUPPORTED ROBOTS

See table

#### COMPATIBLE WITH

Virtuose 6D TAO

#### DELIVERABLES

TREX Box + license for your robot model

#### HAPTION S.A.

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# TELEROBOTICS EXTENDER

## URE™ CONNECTOR

Haption's hardware products can be used as input devices to control robots remotely, in an intuitive manner. The operators are removed from the dangerous zone and still keep their dexterity through the force feedback system. Thanks to the force-feedback, they are able to monitor the force applied by the robot to its environment, thus reducing the risk of damage.



# Telemaintenance

# Robotics

# Remote handling

### FUNCTIONALITIES

- ✓ Bilateral control with force-feedback
- ✓ Clutching in translation and rotation
- ✓ Adjustable base rotation
- ✓ Adjustable force and movement scaling
- ✓ Smooth transition between control modes
- ✓ High level of safety
- ✓ Multi-lingual Graphical User Interface

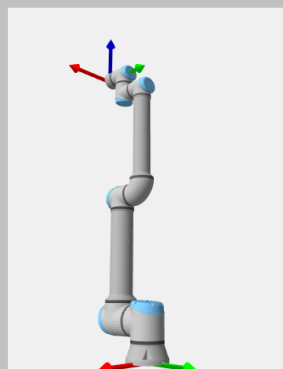
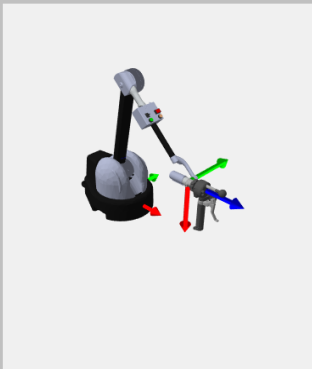
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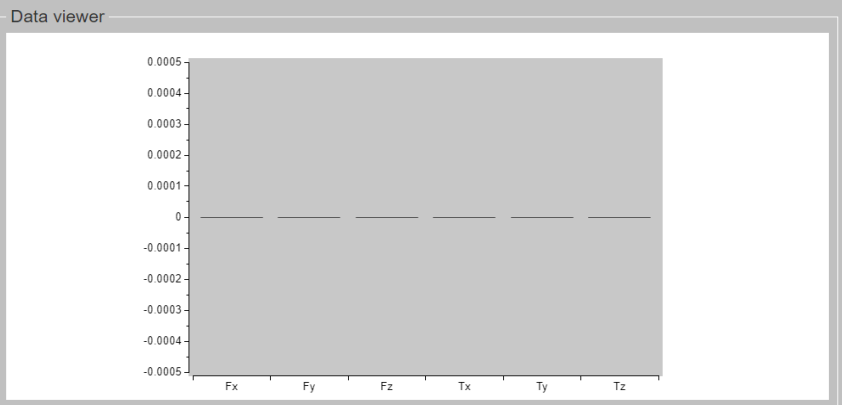
Master

Slave

Data



Choose data to plot  
Slave Cartesian Force



Force factor  
 1/1  1/3  1/5

Movement Scale  
 0.5  1.0  1.5

### SUPPORTED SLAVE ROBOTS

Universal Robots e-series  
Polyscope 5.9 or newer

### COMPATIBLE WITH

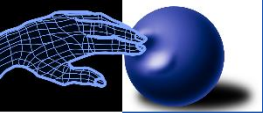
Virtuose 6D TAO

### DELIVERABLES

UR Connector PC  
TeleRobotics EXTender URCAP

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# TELEROBOTICS EXTENDER

haption

## KUKA IIWA® CONNECTOR

Haption's hardware products can be used as input devices to control robots remotely, in an intuitive manner. The operators are removed from the dangerous zone and still keep their dexterity through the force-feedback device. Thanks to the force-feedback, they are able to monitor the force applied by the robot to its environment, thus reducing the risk of damage.



# Telemaintenance

# Robotics

# Remote handling

### FUNCTIONALITIES

- ✓ Bilateral control with force-feedback
- ✓ Clutching in translation and rotation
- ✓ Adjustable base rotation
- ✓ Adjustable force and movement scaling
- ✓ Weight compensation of the Gen3
- ✓ Redundancy management
- ✓ Smooth transition between control modes
- ✓ High level of safety
- ✓ Multi-lingual Graphical User Interface

Beside our hardware products, we provide software modules and technical expertise for the implementation of telerobotic applications.



Typical installation

### SUPPORTED ROBOTS

KUKA® IIWA – LBR  
Requires Kuka Sunrise.  
Workbench 1.16 with FRI and GripperToolbox

### COMPATIBLE WITH

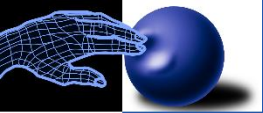
Virtuose 6D TAO

### DELIVERABLES

TREX Box  
TREX KUKA Connector

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# TELEROBOTICS EXTENDER

## KINOVA® CONNECTOR

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# Telemaintenance

# Remote handling

# Robotics

### FUNCTIONALITIES

- ✓ Bilateral control with force-feedback
- ✓ Clutching in translation and rotation
- ✓ Adjustable base rotation
- ✓ Adjustable force and movement scaling
- ✓ Weight compensation of the Gen3
- ✓ Redundancy management
- ✓ Smooth transition between control modes
- ✓ High level of safety
- ✓ Multi-lingual Graphical User Interface

Beside our hardware products, we provide software modules and technical expertise for the implementation of telerobotic applications.



Typical installation



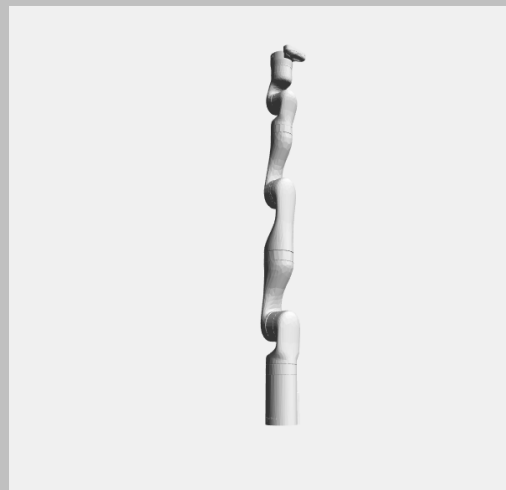
Master



Force factor

1/3  1/5  1/10

Slave



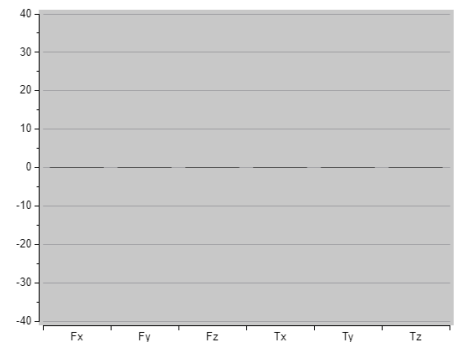
Data

Choose data to plot

Slave Cartesian Force

Data viewer

Force(N)



Last status:

### SUPPORTED SLAVE ROBOTS

KINOVA® Gen3

### COMPATIBLE WITH

Virtuose 6D TAO

### DELIVERABLES

TREX Box

TREX KINOVA Connector

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