

TREX : TELEROBOTICS EXTENDER

Haption's TREX is the generic teleoperation controller compatible with many leading robot manufacturers and with Haption's force-feedback devices. It is used to control robots manually from a distance, in an intuitive manner with no-code. The operators are removed from the dangerous zone and still keep their dexterity and make full use of their manual skills.

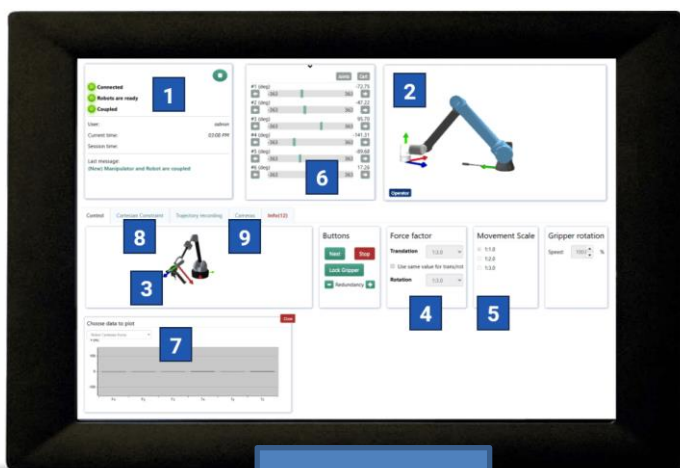


OFF-THE-SHELF PRODUCT = COST-EFFECTIVE SOLUTION

Remote handling

Telemaintenance

Robotics



PRACTICAL AND INTUITIVE HUMAN MACHINE INTERFACE

1. Visualization of the teleoperation status
2. Real-time 3D visualization of robot
3. Real-time 3D visualization of the force-feedback device
4. Control box for the force scaling ratio
5. Control box for the movement scaling ratio
6. Visualization of each robot axis position, with manual control capability
7. Visualization of robot force and torque
8. Guiding feature for the operator, using cartesian constraints
9. Selection of the point of view for the operator, when using static or embedded cameras

Client terminal

Client App



Human Connector



COMPATIBLE WITH LEADING ROBOT MANUFACTURERS

Robot Connector

Ethernet
| Optical fibre
| Internet
| 5G | RF | WiFi6

External I/O: tools, sensors, collision avoidance, ...



COMPATIBLE WITH FORCE-FEEDBACK MANIPULATORS

- Virtuose 6D TAO to control robots with payload < 6 kg
- Virtuose 6D TAO HF to control robots with payload > 6kg

The TREX vision



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Haption's TREX is the generic teleoperation controller providing immediate & intuitive control with no-code and useful features such as:

- ✓ Operator Camera View Management
- ✓ Operator Guidance Features
- ✓ OPC-UA interface, the Industry 4.0 standard for data exchange



GENERIC & OFF-THE-SHELF PRODUCT = LONG-TERM SUPPORT

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TREX FUNCTIONALITIES

TREX VERSION 1.3

- ✓ Possibility to by-pass the standard GUI with OPC UA or with C++ (TREXClient)
- ✓ Improved connectivity and stability
- ✓ Support for system snapshots

TREX VERSION 1.2

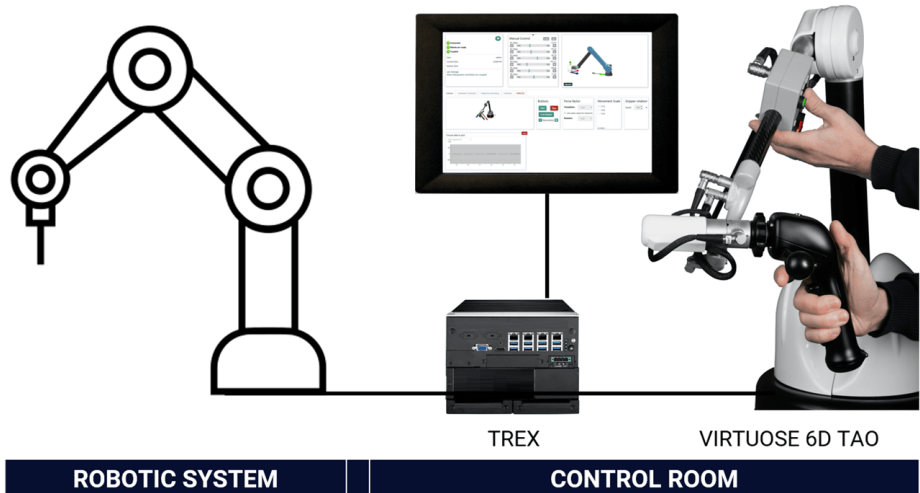
- ✓ Possibility for the site manager to change the joint limits of the robot (within the physical limits)
- ✓ Viewpoint of camera attached to a robot segment
- ✓ Internal collision prevention
- ✓ Limitation of robot movement with a bounding box
- ✓ Possibility to duplicate an existing coupling configuration
- ✓ 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

TREX VERSION 1.0 & 1.1

- ✓ Bilateral control with force-feedback
- ✓ Types 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 with cryptographic signatures
- ✓ Multi-lingual Graphical User Interface

If your application requires a specific feature, get in touch!

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



COMPATIBLE WITH

- ✓ Virtuose 6D TAO to control robots with payload < 6 kg
- ✓ Virtuose 6D TAO HF to control robots with payload > 6kg

Connection between TREX and VIRTUOSE over Ethernet, and possible over EtherCAT on request.

DELIVERABLES

TREX Box + license for your robot model.

System security updates during 5 years.

TREX application updates during 1 year (yearly maintenance contract available).

Not provided by Haption :

- ✓ Robot and its support
- ✓ Camera and video network
- ✓ Display monitor, USB mouse & keyboard, Ethernet cables
- ✓ WIFI 6.0 or 5G network, Ethernet network and hubs
- ✓ CE, FCC or CCC marking of the full system

BUNDLE TREX + VIRTUOSE 6D (HF) TAO

With our bundle offer, you are ready to take control of your own telerobotic system in no time! Ask us!

CYBERSECURITY

TREX does not require any connection to the Internet. Updates are provided as download links with MD5 signatures, and can be deployed via USB key.

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Robot vendors	Models	Prerequisites	Force feedback	Dynamic feedback
FANUC	M20iB-35S M20iD25 M710C-45M	Controller R30iBPlus running software v9.30 P13 with RAM upgrade running at 4ms Stream Motion option	Yes with Force Sensor Option	Yes
	LR Mate, M & R Series	Controller R30iBPlus running software v9.30 P13 with RAM upgrade running at 4ms Stream Motion option	To be tested	Yes
	LR Mate, M & R Series	With other controller compatible with Stream Motion option	No	Yes
Kawasaki Robotics	RS, BX, MS Series (*)	Controllers F60, E01, E02	No	Yes
Kinova	Gen3	None	Yes	Yes
	Gen3 6dof	None	Yes	Yes
KUKA	LBR iiwa 7 R800 LBR iiwa 14 R820	KUKA Sunrise 1.16 or newer with FRI and GripperToolbox	Yes	Yes
	KR10R900 KR20R1810 KR20R3100	Controller KRC4 or KRC5 with KUKA.RobotSensorInterface	Yes with Force Sensor Option	Yes
	KR120R3500 KR180R2500 KR180R2900	Controller KRC4 or KRC5 with KUKA.RobotSensorInterface	To be tested	Yes
	Other KR	Controller KRC4 or KRC5 with KUKA.RobotSensorInterface	To be tested	Yes
Stäubli	TX2	Controller CS9 with uniVAL Drive 2	No	Yes
	TX2	Controller CS9 with VAL3	No	Yes
Universal Robots	URe Series: UR3e, UR5e, UR10e, UR16e, UR20	Polyscope 5.9 or newer	Yes	Yes
Doosan	H Series	None	Yes	Yes
Agile Robots	Diana7 Franka Resharch 3	Controller version 2.16 or newer	Yes	Yes
	Franka Panda	None	Yes	Yes

Is your robot not yet listed above? Contact us!

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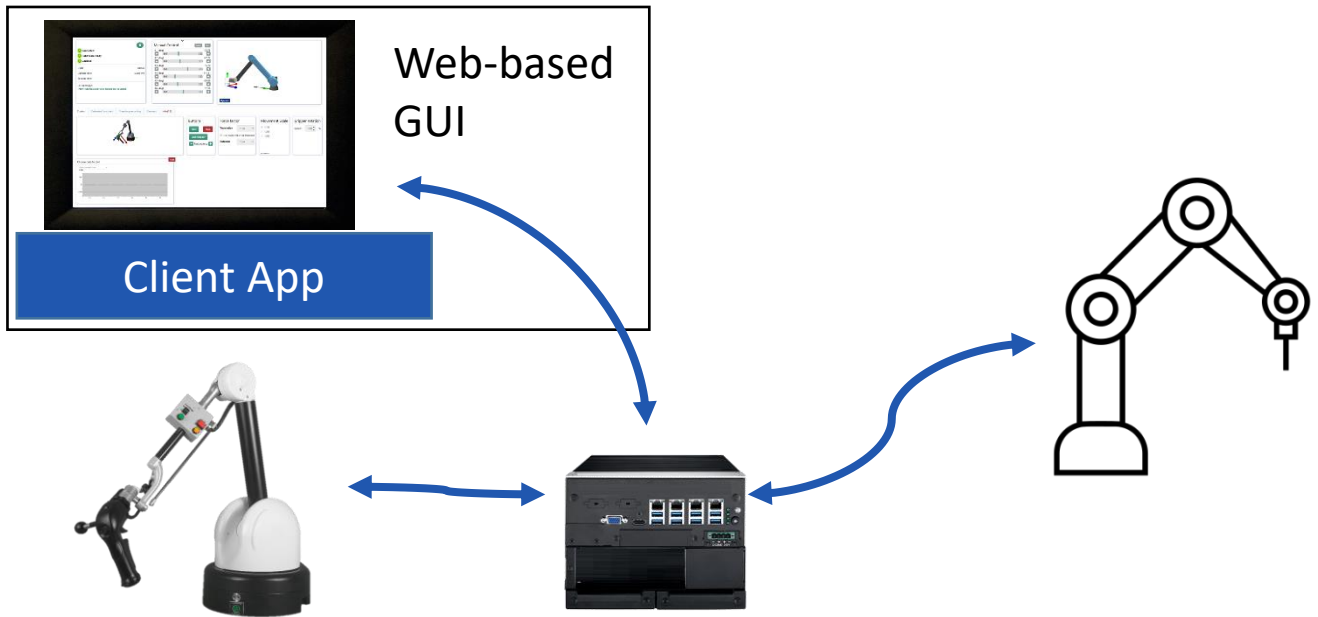
- ✓ SINGLE ROBOT or SINGLE ROBOT in WIRELESS
- ✓ MULTIPLE ROBOTS in NON SIMULTANEOUS usage
- ✓ MULTIPLE ROBOTS in SIMULTANEOUS usage



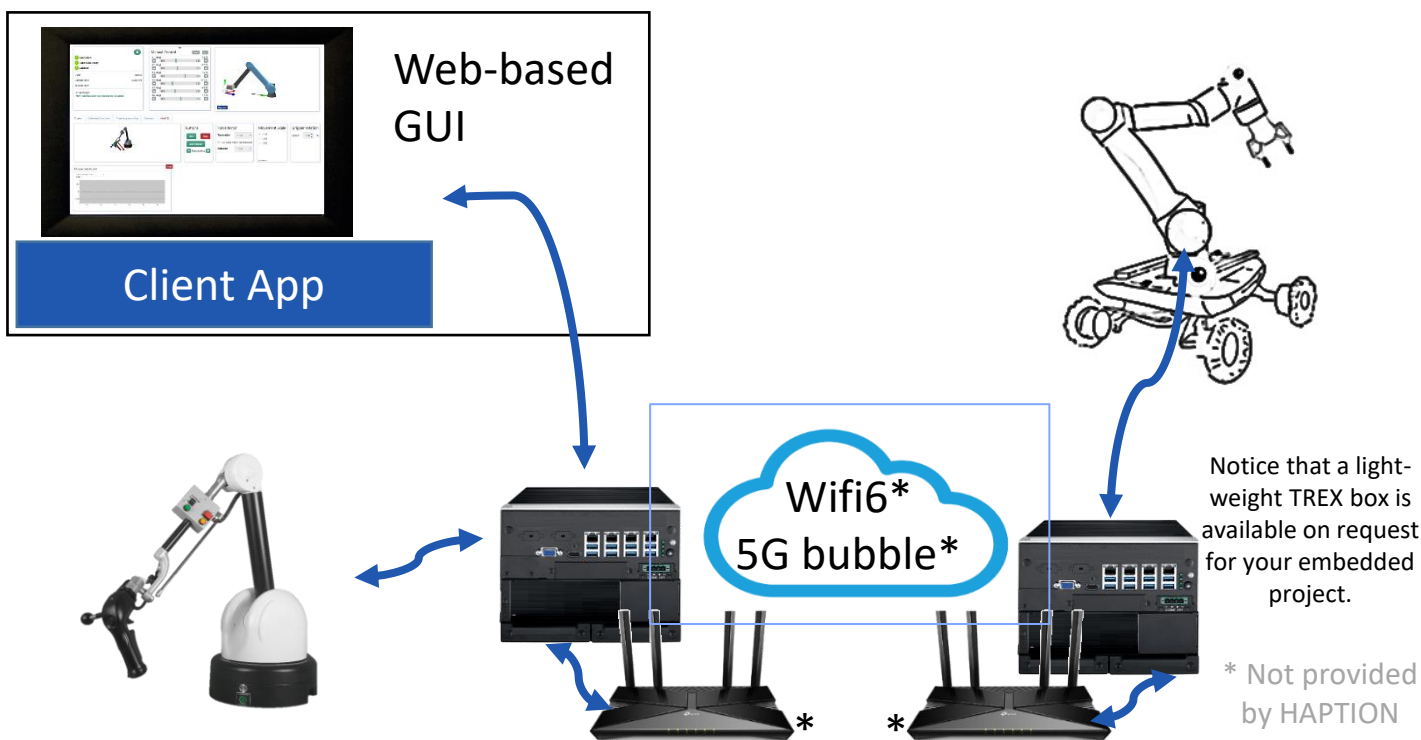
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SINGLE ROBOT



SINGLE ROBOT in WIRELESS



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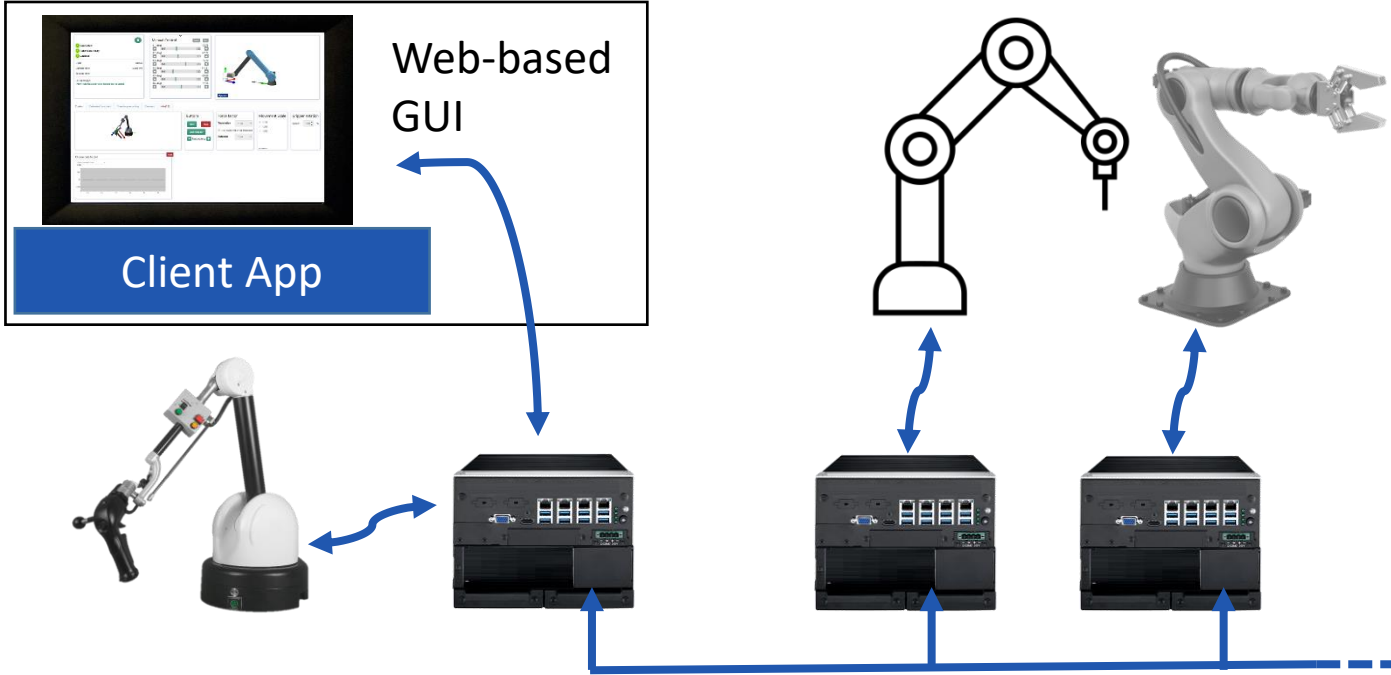
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ROBOTS in NON-SIMULTANEOUS



ROBOTS in SIMULTANEOUS

