Product Bulletin

ActiNav Next-generation Machine Loading v1.5 Release

Date: October 19, 2021

Product(s) Affected: ActiNav Next-generation Machine Loading

Summary:

Universal Robots is pleased to announce the v1.5 release for ActiNav. This release is a major, “double-sized” software release for ActiNav Next-generation Machine Loading and gives ActiNav many new capabilities. These include UR16e support, outside diameter (OD) picking with fingers, picking OD and ID in the same program, improved picking performance at the bottom of deep bins and enhanced matching algorithms for overlapping parts. ActiNav v1.5 runs unattended longer and with fewer operator assists due to force-torque sensor monitored picking and placing, bin alignment detection, enhanced path planning, and more.

Usability and ease of use enhancements include quick tool changer support, 2D live camera view, importing CAD models of a wider range of sizes and formats, motion start actions, conditional alerts that enable easy bin refill and simple retract at place. And v1.5 UI now supports more languages. These new features and more make ActiNav even better and ready to solve an ever-expanding list of machine loading applications.

This bulletin also contains details about other new features in v1.5 as well as updates on ActiNav-optimized UR+ accessories, new documentation, and tech notes, as well as new UR Academy ActiNav training offerings.

Product Details:

Functional Features and Enhancements

- **Outside diameter gripping** is enabled with a new parameter that allows users to define the space needed for the tool fingers around the part when externally picking parts. This means ActiNav can find parts and paths for outside picks even when adjacent parts are present.

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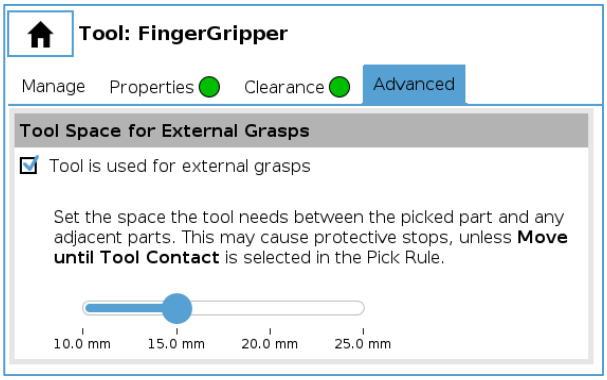
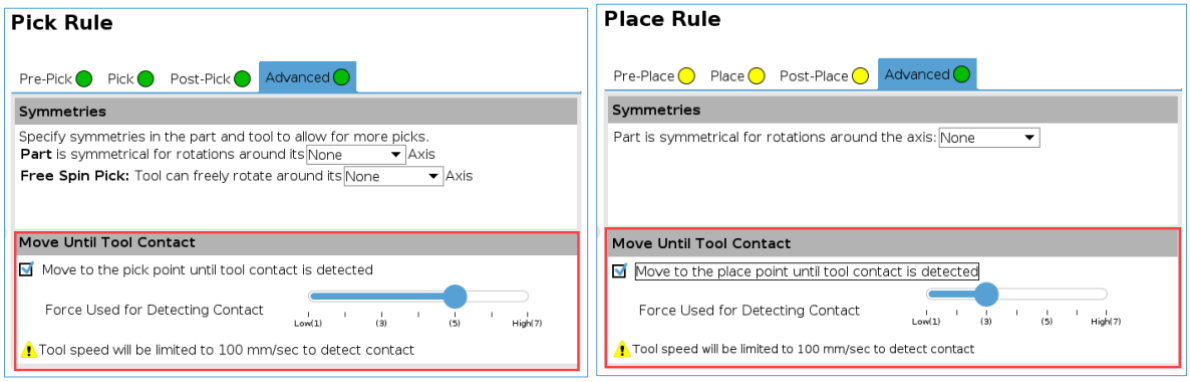


New tool configuration screen for external grasps

- **Force-monitoring at pick and place** enables ActiNav to take full advantage of the force torque sensor built into e-Series robots. When force-monitoring is enabled, ActiNav monitors the force applied by the tool during pick and/or place. When the force exceeds the user-defined threshold, ActiNav stops the robot from applying force, drives it to the home node where it then continues its task thus avoiding undesired protective stops. Thanks to force-monitoring, part-picking ratios increase, and longer unattended runs are possible, avoiding stops due to shifting parts or densely packed bins.



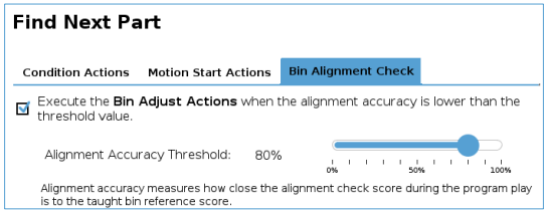
New force-monitoring settings in the Pick Rule and Place Rule windows

- **Detach Part program node** lets users drop a part instead of placing it. This optimizes path planning and program flow in situations where precise part placement is not required, or where a part has not been properly picked.

- **UR Move Sequence program node** makes programming more efficient and easier to add regular waypoint movements to the ActiNav program. When MoveJ/MoveL instructions are inserted in this node, ActiNav will re-take control of the robot after these movements are executed. Users can decide whether they want ActiNav to automatically return the robot to the position where it was before these movements started or to continue directly to the next position in the path-planned task.

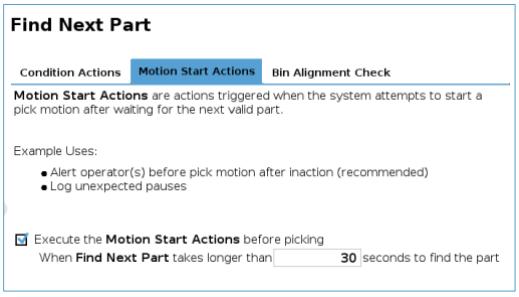
- ActiNav 1.5 is more responsive than ever to a wide range of situations that require the robot to exit the normal pick and place loop and execute specific handling routines. Some examples can be turning on a stack light to notify operators that the robot will start moving or that the bin needs to be refilled, executing a series of robot motions, or waiting for the bin to be properly placed:

- **Bin alignment check** lets ActiNav detect the bin's position with each scan, which enables the user to program specific routines if a deviation in the bin position is detected.



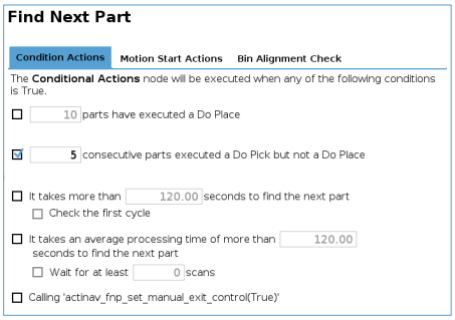
New Bin Alignment Check configuration tab in the Find Next Part program node

- **Motion Start monitoring** enables users to define warning actions before the robot moves again after being idle for longer than a user-defined time threshold.

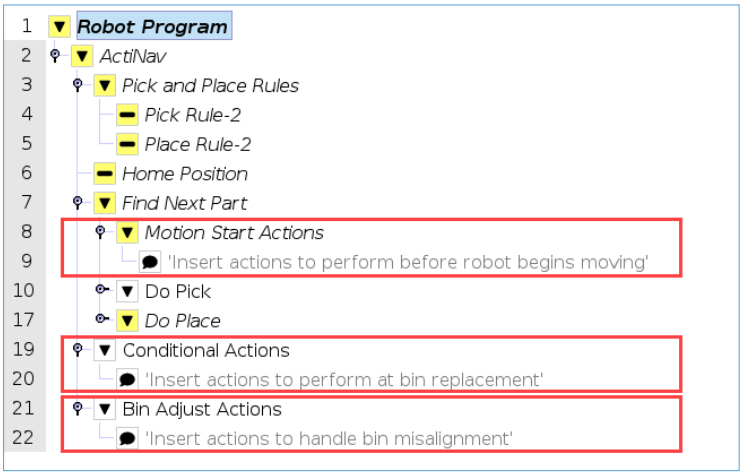


New Motion Start Actions configuration tab in the Find Next Part program node

- **Program conditions monitoring** lets users program handling actions for situations like "bin is empty" or "no more pickable parts left".



New Condition Actions configuration tab in the Find Next Part program node

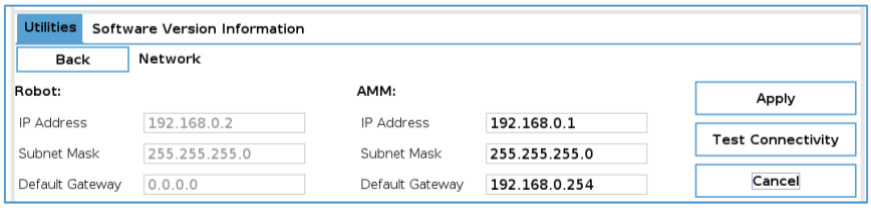


New Motion Start Actions, Conditional Actions and Bin Adjust Actions program nodes in the ActiNav loop

- **Performance optimizations include:**
  - Smoother robot motion for leaner and more fluid robot movements.
  - Enhanced path planning logic to increase chances of finding valid robot paths sooner than before for demanding picking or placing movements.
  - Performance improvements in part perception and edge perception to locate more parts with higher confidence.
  - Optimized pick prioritization, path planning and location of overlapped parts to find and pick more parts in deep bins faster than before.

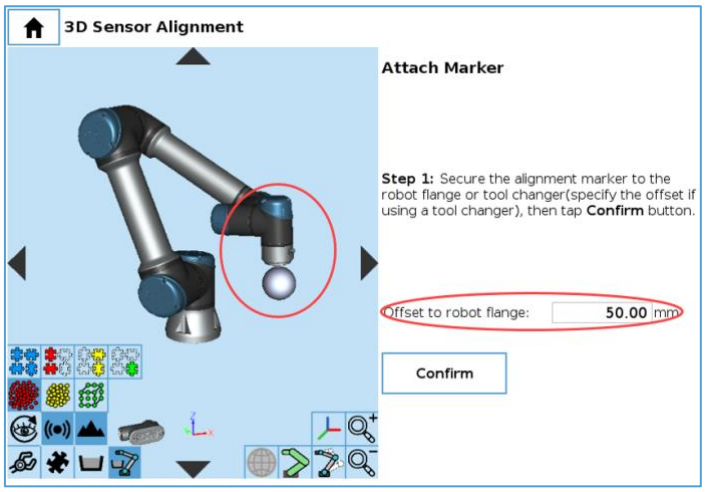
Usability Features and Enhancements

- **Customizable IP addresses** means users can now set the AMM and robot IP address to match their networking requirements. This increases installation flexibility and simplifies ActiNav integration with PLC's, machines and customer networks.



New Network settings in the System configuration window

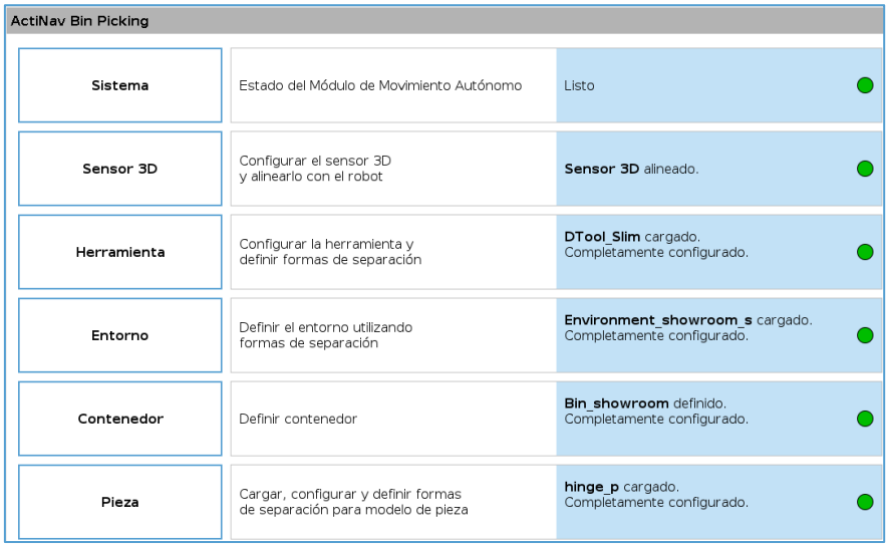
- **Quick tool changer support** allows ActiNav to be compatible with tool changers during alignment and operation. Users can set the thickness of the tool changer and ActiNav will adapt its calculations and the visualization in ActiNav Viewer.



New offset parameter in the 3D sensor alignment wizard

- **2D live view** streaming from the scanner during the bin configuration makes it easier to place the bin in an optimal position relative to the scanner and robot.

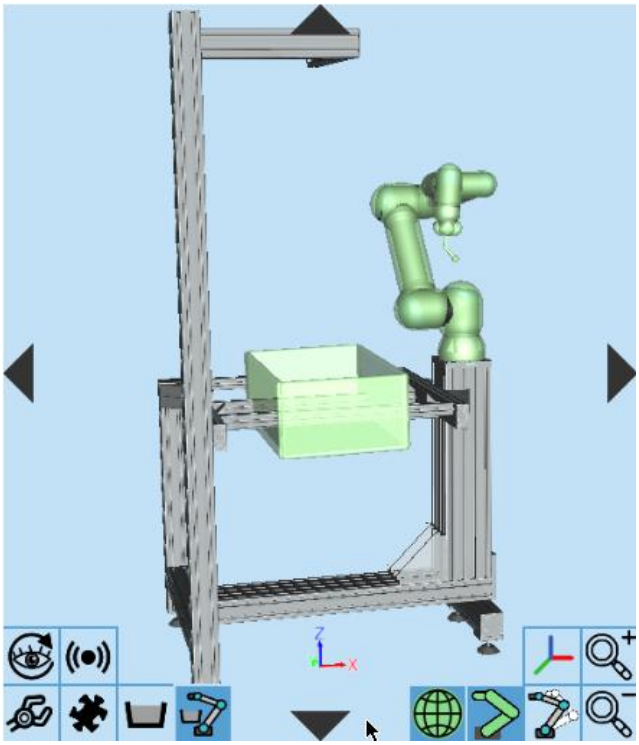
- **UI-supported languages expanded** now include Spanish, Italian, French, German, Japanese, Danish and English. Simply set the robot language and the ActiNav UI will change.



ActiNav installation window in Spanish

- **Extended CAD model support** includes compatibility with more CAD file formats and virtually any CAD file size. Supported CAD formats now include OBJ, STP, STEP, PLY and STL. Moreover, ActiNav now does an automatic model analysis and simplification process during CAD import, allowing users to import complex models.

- **A 3D model of the work cell** can now be added to ActiNav's environment for a more complete 3D visualization and easier, more accurate clearance shape definitions.



3D visualization of the environment's CAD model in ActiNav's 3D viewer (in Teach Pendant)

- **System logging improvements** enable better and more agile support. Logged data now includes more information and can be recorded in compressed format for simpler handling. Users may now export their System State to a USB drive plugged directly to he AMM instead of the teach pendant for up to 80% faster exports.

Version Compatibility

PolyScope 5.11 - ActiNav v1.5 is compatible and fully tested with the latest PolyScope 5.11. ActiNav compatibility with upcoming PolyScope versions will be announced with every released ActiNav version.

UR16e – besides UR5e and UR10e robot arms, ActiNav 1.5 adds full support to UR16e arms for high-payload machine loading applications.

ActiNav Documentation and Tech Notes:

Link to all downloadable ActiNav technical documentation: https://www.universal-robots.com/download/?filters[]=68801&query=

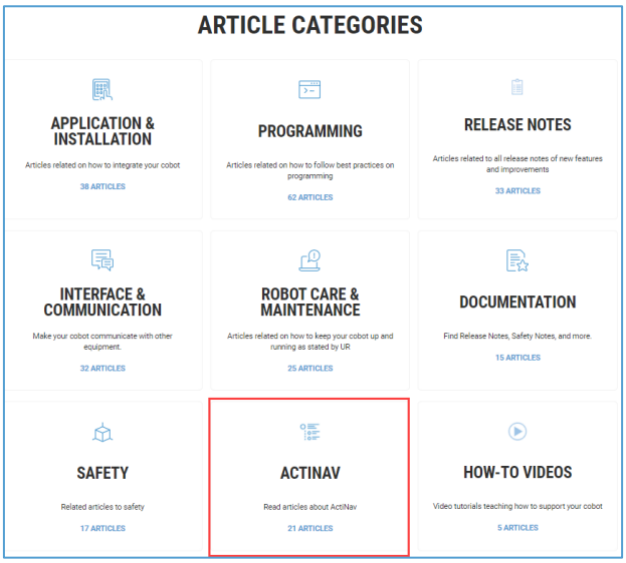
Link to all ActiNav technotes: https://www.universal-robots.com/articles/?filters[]=68801&type[]=1

New ActiNav Integrator's Guide. There is a new manual called the Integrator's Guide which is in addition to the Quick Start Guide and the Operating Guide. The Integrator's Guide covers topics not related to software programming or UI. Topics include range from end effector design considerations to workcell layout optimization or part qualification observations.

Updated ActiNav Quick Start Guide with more complete safety and installation observations is now available in English, Spanish, Italian, French, German, Danish and Japanese.

Updated ActiNav Operation Guide has been completely restructured to include all new features and functionalities as well as procedures on how to use them and general tips and observations for users. It is also available in English, Spanish, Italian, French, German, Danish and Japanese.

Many new ActiNav tech notes have been added to the UR Support website which brings the total to 21. You can access these tech notes at www.universal-robots.com/support by selecting article category ActiNav or by searching 'ActiNav.'



ActiNav category in Universal Robots Support site's articles

Tech Note using "Current Pick" variable lets the user program different actions depending on how ActiNav picked the part. A useful feature, for example, for parts that may need to be re-gripped in an intermediate station, depending on which side the robot picked it from. Users can read further on this topic on two newly available technical notes.
https://www.universal-robots.com/articles/ur/actinav/actinav-using-the-currently-selected-pick-rule-as-a-conditional-expression/
https://www.universal-robots.com/articles/ur/actinav/actinav-how-to-select-different-tool-actions-based-on-pick-type/

Tech Note on manual simplification of CAD models. Actinav v1.5 includes a feature to automatically simplify CAD models during their import. However, for users that want to manually control the model simplification process, this article shows how to use the open source program "Meshlab" to achieve that.
https://www.universal-robots.com/articles/ur/actinav/actinav-how-to-use-meshlab-to-resize-your-part-models/

Tech Notes on pneumatic and electrical cable management. There are two tech notes with recommendations on coiled hosing and cables. Please review those here:

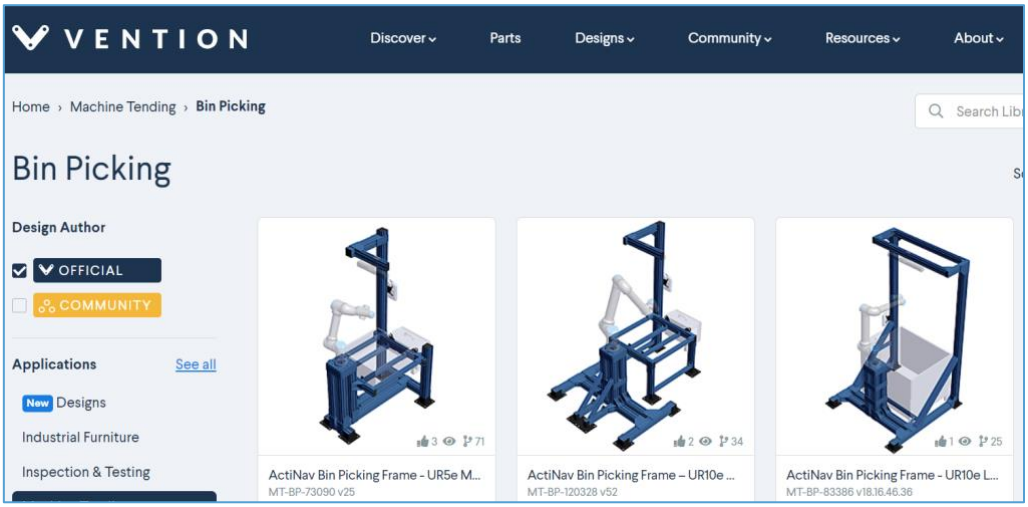
https://www.universal-robots.com/articles/ur/actinav/actinav-cable-management-tech-note/

https://www.universal-robots.com/articles/ur/actinav/actinav-pneumatic-hose-management/

ActiNav UR+ Products:

New Vention ActiNav Frames. UR+ Partner Vention has released two new standard ActiNav frames for UR10e as well as a revised and improved UR5e frame. These can be purchased directly from Vention as designed or these designs can be used as a starting point to create a customized frame.

- ActiNav Bin Picking Frame - UR5e Medium https://vention.io/designs/actinav-bin-picking-frame-ur5e-medium-73090
- ActiNav Bin Picking Frame - UR10e Medium https://vention.io/designs/actinav-bin-picking-frame-ur10e-medium-120328
- ActiNav Bin Picking Frame - UR10e Large https://vention.io/designs/actinav-bin-picking-frame-ur10e-large-83386



Official ActiNav stand designs in Vention's website

New ActiNav-Optimized Components:

Piab piCOBOT

The Piab piCOBOT is custom made for Universal Robots collaborative robots (UR3, UR3e, UR5, UR5e, UR10, UR10e and UR16e if not exceeding 7kg/15lbs) and boasts flexible setting options to perfectly match application needs. The ActiNav-optimized kit includes an angled head, 4x suction cups as well as coiled air hose management. piCOBOT includes UR software capabilities (URCaps) for quick and easy installation/implementation and programming, compatible with E-series and CB-series.

Robotiq Hand-E

The Robotiq Hand-E is a reliable and easy to use gripper, designed for industrial automation. The new Bin Picking Finger Kit brings high gripping flexibility to the ActiNav bin picking system. Hand-E + BP Finger Kit allows the system to pick the parts in different ways (i.e., internal and external) for more flexibility. The Hand-E Grip Validation feature is connected with ActiNav, allowing the system to automatically retry a grasp if a part is not picked properly.

***Coming Soon*: Magswitch CoBot SmartMapGrip E30**

The Magswitch CoBot SmartMagGrip is specifically designed to work with UR e-series robots in bin picking and material handling of ferromagnetic parts. It incorporates all the same features as a typical Magswitch E-Series tool, including variable field output (VFO) and integrated sensing technology. The CoBot SmartMagGrip E30 is currently supported with direct integration to Universal Robots through the Tool IO connector with a URcap communicating via RS-485.

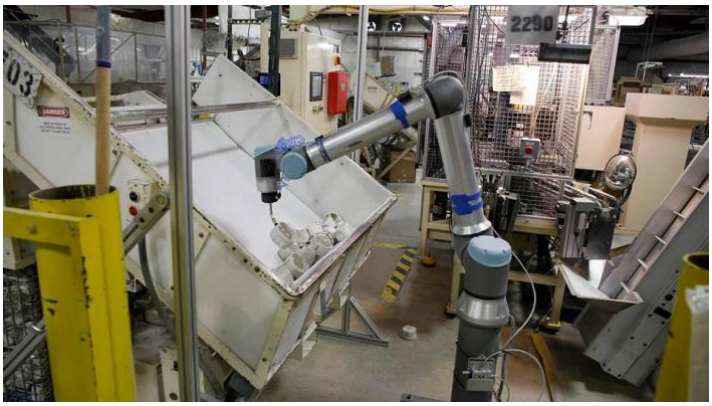
Case Stories:

Customer Testimonials and Case Studies – There are now five case study videos available. Be sure to check out each one and monitor the case stories page for new customer testimonials:

PrecisionForm deployed Universal Robots' ActiNav Application Kit for flexible machine loading, enabling them to boost competitiveness, overcome labor challenges, empower their workforce and extend the lifespan of older equipment. Learn more about it here.

Flywheel's high-mix, low-volume production made it difficult to cost-effectively automate processes such as repetitive, manual machine tending and welding tasks. The ActiNav Application Kit for flexible machine loading does just that, processing a wide variety of part numbers. Learn how here.

Allied Moulded chose ActiNav to automate an important bin-sourced machine loading application. The deployment enabled them to reduce overtime expenses, move existing workers to more ergonomic tasks and improve consistency in the production process. Learn more here.



To address labor shortages and longer cycle times, **New England Union** deployed a UR10e cobot and ActiNav to run unattended all night long. With ActiNav, NEU can increase output with the same number of employees. Learn how here.

In Cheraw, South Carolina, two **Schaeffler Group USA** factories produce high-precision engine components and industrial products. Schaeffler turned to the Universal Robots (UR) ActiNav machine tending kit with a UR5e cobot to automate manual assembly lines and improve labor utilization and productivity. Learn more here.

ActiNav Communications Opt-in Mailing List

Would you like to stay up to date with ActiNav support and marketing information? Would you like to hear about new ActiNav updates, new software capabilities, be notified of any stability releases, new UR+ accessories, successful applications and more? Then sign up for the ActiNav Mailing List HERE.

If you have any questions, please contact Eric Andersen, Senior Product Manager, at eran@universal-robots.com or ActiNav North America at ActiNavNA@universal-robots.com.