

# Product Bulletin

CONSTRUCTION ROBOTICS

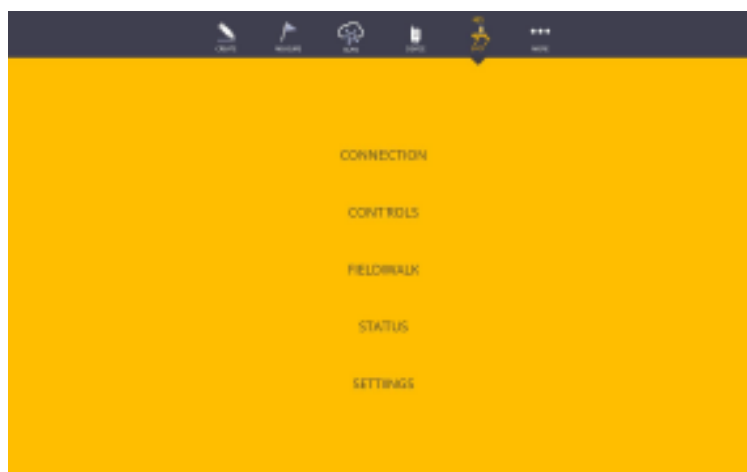
OCTOBER 2021

## FIELDLINK v6.1 - ROBOTICS MODULE

### INTRODUCTION

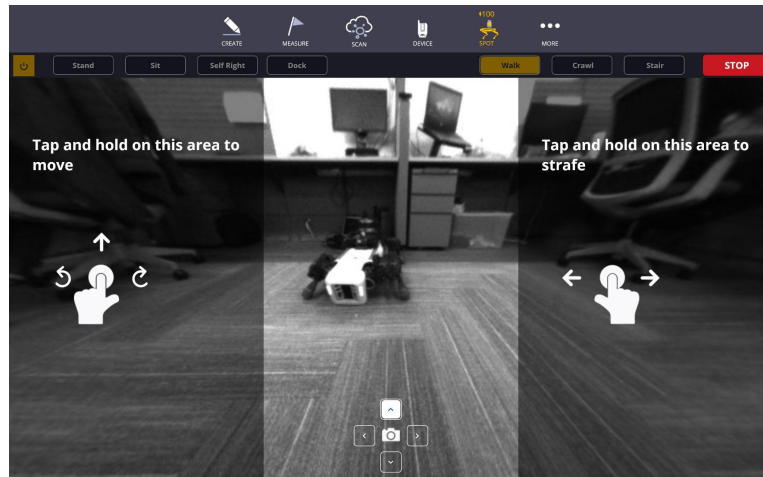
The Construction Robotics team is pleased to announce the release of FieldLink v6.1 and the Robotics Module for integration into the Boston Dynamics Spot robot platform. Robots in construction have the potential to enhance field-oriented workflows, reduce the amount of rework, and facilitate on-site tasks. Utilizing robots for routine tasks in hazardous environments such as construction sites can improve safety, efficiency, and data capture consistency. Trimble and Boston Dynamics announced an exclusive alliance agreement for Trimble to be the sole integration partner for construction data collection technologies, including 3D laser scanning, GNSS, and robotic total stations with Boston Dynamics' Spot robot. With a focus on building construction and civil construction workflows, Trimble and Boston Dynamics will introduce new products and services to advance the use of robotics in the construction industry.

Integration with FieldLink and the Trimble X7 3D Laser Scanner co-developed with Boston Dynamics, the FieldLink software includes a dedicated Robotics Module with controls to operate the Boston Dynamics Spot robot and the Trimble X7 3D laser scanner. Users are able to control the navigation of Spot to manually explore a construction site, teach Spot a mission to navigate autonomously, operate the Trimble X7 3D laser scanner to collect scan data, and utilize the Spot docking station (Spot Dock) to automatically charge the battery on Spot and the X7 3D laser scanner



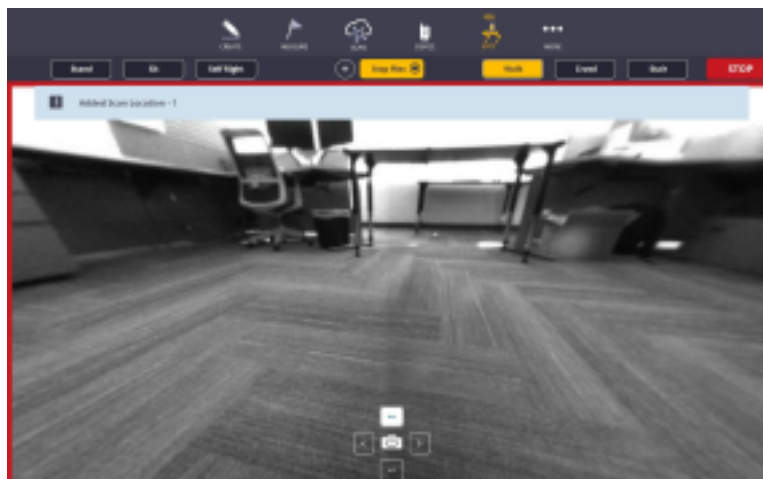
## Integrated Controls for Boston Dynamics Spot Robot

Through the FieldLink interface, users are able to manually operate Spot using digital joysticks via the Trimble tablet touchscreen. When connected, the on-board cameras on Spot are activated and visible on the Trimble tablet where a user can enable a specific view by clicking on the camera icon on the screen. Additional features in the Spot Controls include the ability to make Spot stand, sit, self-right, dock, walk, crawl, and navigate stairs. An emergency eStop button is provided to immediately cancel any current action by Spot and have the robot safely sit on the ground.



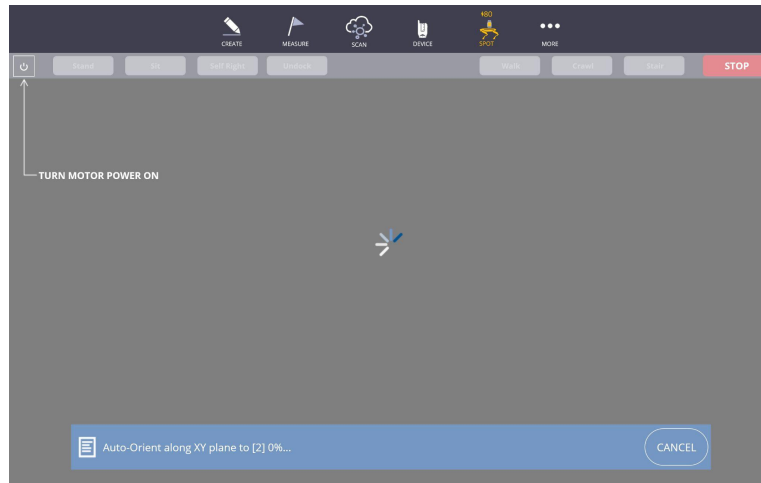
## FieldWalk Tool for Autonomous Missions

The FieldWalk tool enables a user to record a path for Spot to walk autonomously and capture measurement data using the X7 3D laser scanner. Users first manually navigate Spot along a route to record the path to walk autonomously. As the path is being recorded, scanning locations along the route, called waypoints, are added to the FieldWalk mission to indicate where a laser scan will be collected. After the path and waypoints have been recorded, the mission is stored in the FieldLink file and can be initiated at any time as an autonomous mission by returning Spot to the starting point of the path.



## In-field Registration of Scan Data

At the conclusion of a FieldWalk mission, the collected data is transferred to the tablet controller. The scan data is then automatically registered in the field as a composite point cloud representation of the project to be shared with construction teams.



## Key Benefits

### Autonomous Scanning Operation

Enable the collection of consistent and reliable data for improved production and quality control monitoring. Document change and perform design validation to ensure the as-built condition matches the as-designed intent.

### Safe Scanning, Continuously

Send Spot and the X7 laser scanner into unsafe conditions to perform dirty, dull, or dangerous tasks. Improve job site safety and address labor shortages.

### Automated Scan Registration in the Field

In-field registration with Trimble FieldLink software ensures the right data is captured the first time. Perform real-time design validation workflows such as scan-to-model comparisons and surface analysis inspections to make immediate decisions in the field without leaving the job site.

### Integrated Docking Station

A self-charging station for Spot transforms the robot into a truly autonomous remote inspection tool. Utilize multiple docks to facilitate long missions on remote sites. With built-in dock detection, Spot will automatically recognize where to dock to charge Spot and the X7 laser scanner.

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## Scan Data Upload

A built-in Gigabit Ethernet connection in the docking station enables the fast offload of registered scan data from the X7 laser scanner. Immediately access scan data at the end of a mission or post to a cloud sharing platform to perform design validation analysis.

## Integrated Ruggedized Tablet

A ruggedized Trimble tablet allows you to control Spot and the X7 laser scanner through one device. Use the tablet to define a mission for Spot, set scanning parameters for the X7, perform in-field registration, design validation, and access Trimble Connect for project communication and collaboration tools.

## Availability

FieldLink v6.1 and the Robotics Module are available now through Trimble and authorized BuildingPoint distribution partners. The Robotics Module is a separate feature set from the core FieldLink application and requires an additional purchase to activate the features. Contact your BuildingPoint Pacific representative today.



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