Spot®

Academia & Innovation Kit

BostonDynamics

ACADEMIA & INNOVATION

The next generation of mobility, sensing, and manipulation. Spot's features serve research efforts across a wide range of industries - from construction to manufacturing, energy & utilities, oil & gas, and more.

Agile

Explore unstructured terrain with unprecedented mobility, going where wheeled robots and drones cannot. Spot cruises over loose gravel, grass, curbs, and stairs by automatically engaging gaits designed to optimize stability.

Customizable

Spot's open platform for sensing and manipulation offers the flexibility you need for research and education. With out-of-the-box functionality, Spot can handle its own mobility, autonomy, and navigation while you augment the robot in the area of innovation most interesting to you.

Intuitive

Whether you're putting Spot to use out of the box with its easy-to-learn tablet controller, or developing a custom application with Spot's API, we have the resources to support you. Get started with Spot in under an hour, with comprehensive support and training offerings to help you scale.
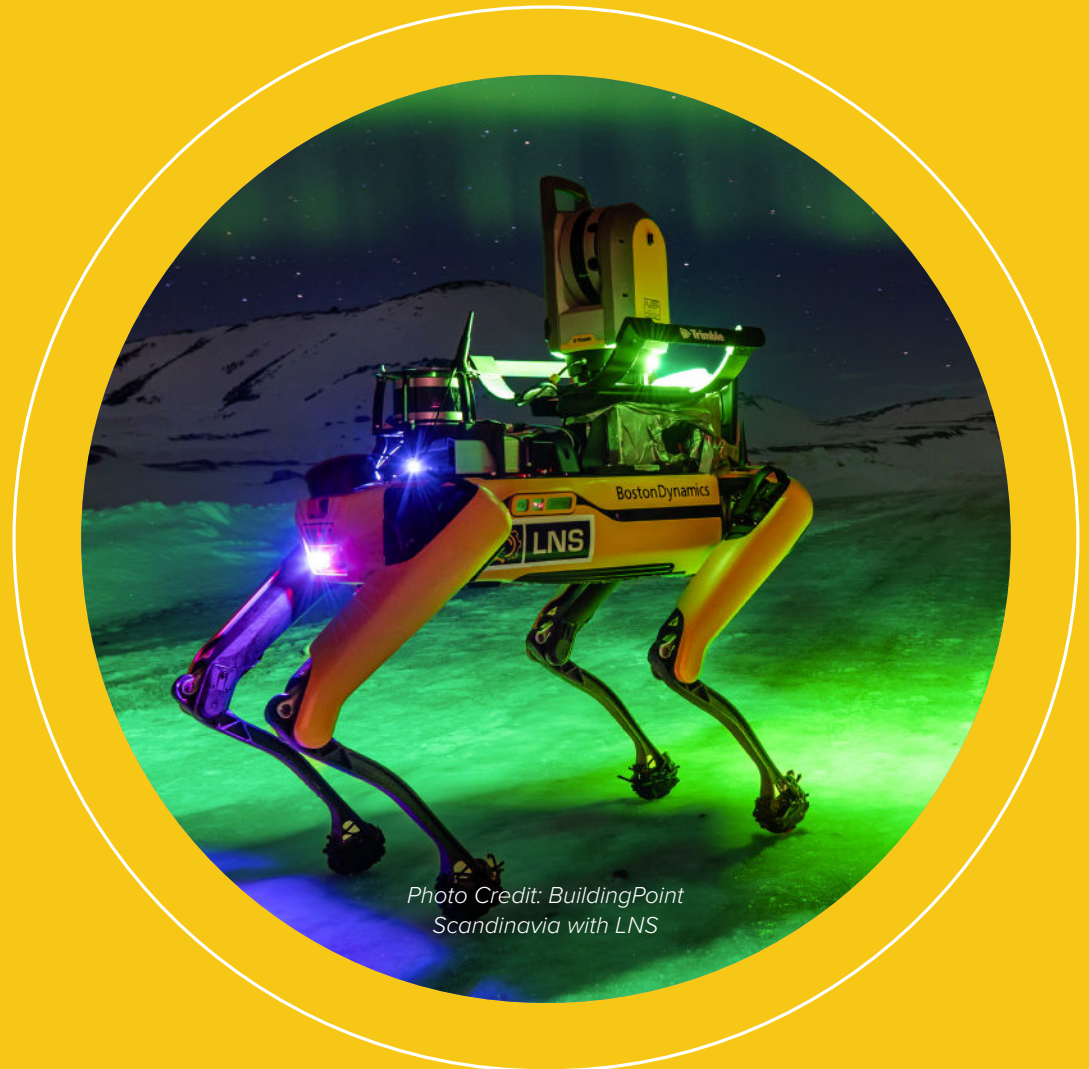

Photo Credit: BuildingPoint Scandinavia with LNS

✓ Autonomy

Spot comes with Autowalk, a feature that allows users to record and replay autonomous missions that can include actions such as data collection and API callbacks. For even more sophisticated autonomy solutions, developers have access to the broader autonomous navigation API that Autowalk is built on.

✓ Manipulation

The Spot Arm allows the robot to interact with the world around it. Through the intuitive tablet interface or the API, users can choose from manual, semi-automated, or fully automated arm actions, such as maneuvering or inspecting objects with the gripper, and even turning valves, flipping levers, and opening doors.

✓ Data Collection & Analysis

Spot's cameras and any attached sensors collect data that can be processed on-robot through the Spot CORE I/O or sent off-robot to be processed elsewhere. Integrate third-party computer vision models, enterprise asset management (EAM) systems, and more.

KIT INCLUDES:

SPOT ARM

SPOT ROBOT

SPOT CORE I/O

SPOT CARE

SPOT ARM

Equipped to operate through both semi-autonomous actions and telemanipulation, the arm will open doors, pick, place, push, or drag objects, and adapt to new situations at the push of a button or swipe of a screen.

Features:

- 6 degrees of freedom plus a gripper
- Semi-automated manipulation options
- Carries up to 11kg (24 lbs)

SPOT CORE I/O

Spot CORE I/O enhances both the computation and communications available on the Spot platform. Easily configure inputs such as sensors, cameras, and other devices to Spot and process data collected into actionable insights.

Features:

- Compact CPU and GPU with customizable inputs and outputs
- 5, 12, and 24V regulated power output
- RJ45 standard ethernet adapter
- Built-in 5G/LTE modem with CBRS support for private networks

SPOT CARE

One year of premium service and support to keep your robot up and running at peak performance.

Features:

- Free damage protection*
- Part replacement
- Quick repair turnaround

*Improper use of Spot is not covered under Spot Care. See our Spot Care Terms and Conditions to see what constitutes improper use.

SPOT SPECIFICATIONS

Academia & Innovation Kit

DIMENSIONS WITH PAYLOADS

Length
1100 mm (43.3 in)

Width
500 mm (19.7 in)

Height (Sitting)
437 mm (17.2 in)

Default Height (Walking)
856 mm (33.7 in)

Max Height (Walking)
946 mm (37.2 in)

Min Height (Walking)
766 mm (30.2 in)

Net Mass/Weight
(Including battery)
43.5 kg (95.9 lbs)

LOCOMOTION

Max Speed
1.6 m/s

Max Slope
±30°

Max Step Height
300 mm (11.8 in)

AUDIO & VISUAL SIGNALS

Pre-configured behaviors for manual and autonomous operations

LED Brightness
Adjustable up to 1010 Lux

Max Projection Distance
1.8 m in front of robot

Buzzer Volume
Adjustable up to 110 dB at 1 m distance from robot

TERRAIN SENSING

Horizontal Field of View
360°

Range 4 m (13 ft)

Lighting > 2 Lux

Collision avoidance
maintains set distance from stationary obstacles

CONNECTIVITY

WiFi
2.4GHz / 5GHz b/g/n Ethernet

Environment Ingress Protection
IP54

Operating Temp.
-20°C to 45°C

BATTERY

Battery Capacity
564 Wh

Average Runtime
90 mins

Standby Time
180 mins

Recharge Time
60 mins

Length
324 mm (12.8 in)

Width
168 mm (6.6 in)

Height
93 mm (3.7 in)

Mass/Weight
5.2 kg (11.5 lbs)

CHARGER

Input Voltage
100-240VAC, 50/60Hz 8A Max

Output
35-58.2 VDC, 12A Max

Length
380 mm (15.0 in)

Width
315 mm (12.4 in)

Height
178 mm (7.0 in)

Mass/Weight
7.5 kg (16.5 lbs)

Operating Temp.
0°C to 45°C

TABLET WITH JOYSTICKS

Height
138 mm (5.4 in)

Width
286 mm (11.3 in)

Depth
56 mm (2.2 in)

Weight
546 g (1.2 lbs)

Touch Screen Size
8" diagonal

Interface Controls
2x Joysticks, 2x 5-direction buttons, and 2x bumper buttons

Resolution
1920x1200

Battery Life
Up to 5 hours

Ingress Protection
Rain and dust resistant

SAFETY AND COMPLIANCE, UNITED STATES

Designed according to ISO 12100 for risk assessment and reduction methodology and IEC 60204-1 for electrical safety.
See Information for Use for further details on intended uses.

Emergency Stop meets ISO 13850

EMC: FCC Part 15B Radio equipment:
Incorporates a FCC Part 68 Certified radio system

Laser product
Class 1 eye-safe per IEC 60825-1:2007 & 2014

SPOT ARM

Degrees of Freedom
6 + gripper

Length (at full extension)
984 mm (38.7 in)

Max. Endpoint Speed
10 m/s

Max. Lift Capacity**
Up to 11 kg (24.3 lbs)

Continuous Lift Capacity**
(at 0.5 m extension)
5 kg (11 lbs)

Max. Drag Capacity**
(on carpet)
Up to 25 kg (55.1 lbs)

Max. Reach Height
1800 mm (70.9 in)

GRIPPER

Depth
90 mm (3.5 in)

Max Aperture
175 mm (6.9 in)

Peak Clamp Force
(at tip of opening)
130 N

Integrated Sensors
Accessory Port, ToF, IMU, 4K RGB, Gigabit Ethernet, 50W power, camera sync (PPS)

**Payload capacities measured at 22°C

SPOT CORE I/O

PROCESSING (JETSON XAVIER NX)

CPU
6-core NVIDIA Carmel ARM V8.2 64-bit CPU with 6MB Lw + 4MB L3 cache

GPU
384-core NVIDIA Volta GPU with 48 Tensor cores

Memory
16GB 128-bit LPDDR4x at 51.2 GB/s

CONNECTIVITY AND STORAGE

5G/LTE
User-installable SIM card. AT&T is the supported 5G provider in the United States; however, customers also have the option of utilizing their own private 5G network. For international customers, users must obtain their own SIM from a local carrier for which there may be additional network restrictions.

Ethernet
GbE interface, unmanaged 2 port Ethernet switch for additional connectivity

Storage
512GB SSD‡

USB 3.1
2x USB 3.1 ports with support for 4.5W

USB-C
1x USB-C port with support for 50W power delivery and video out

SD Card
1x SD card slot

Other Connections
E-Stop interface
PPS output
GPIO (Configurable to PWM output)
I2C Ports

Power Outputs
48V
24V, 50W
12V, 50W
5V, 30W

‡Actual storage available will be less due to operating system.

SECURITY

Disk Encryption
SSD encrypted with standard LUKS technology

Network Encryption
Connections encrypted with TLS 1.2 and 1.3

Authentication
Access to services restricted to authenticated users

Secure Boot
Tamper-proof filesystem with hardware root of trust

Firmware Verification
Firmware updates must be cryptographically signed

Photo Credit: BuildingPoint
Scandinavia with LNS

GET STARTED WITH SPOT TODAY.

Contact our sales team to learn more about
how you can implement the robot on your team:
www.bostondynamics.com/spot-sales

Visit our website at:
www.bostondynamics.com

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