

# LEGO® Education SPIKE™ Prime Technical Specifications

## LEGO® Technic™ Large Hub



<b>Hardware name</b>	LEGO® Technic™ Large Hub
<b>Description</b>	The Hub is a programmable control unit that LEGO sensors and motors can be attached to. The Hub has an intuitive light and button interface and can work autonomously or in streaming mode.
<b>Key features</b>	<ul style="list-style-type: none"><li>• 5x5 LED matrix white display</li><li>• Six input/output ports</li><li>• Six-axis Gyro Sensor (three-axis accelerometer and three-axis gyroscope)</li><li>• Three-button navigation, including light interface</li><li>• Speaker</li><li>• Connectivity to devices using USB and Bluetooth</li><li>• MicroPython operating system</li><li>• The Hub has a Technic build geometry that allows for versatile building and easy integration into models</li></ul>
<b>Connector type</b>	LEGO Power Functions 2.0 (LPF2) for connection to LEGO sensors and motors
<b>Hub capabilities</b>	<p>5x5 LED matrix white display:</p> <ul style="list-style-type: none"><li>• 25 white LEDs</li><li>• Each LED is programmable</li><li>• Each LED can be dimmed in 10-step increments</li></ul> <p>Input/output ports:</p> <ul style="list-style-type: none"><li>• 6x LPF2 input/output ports (ports A, B, C, D, E, and F)</li><li>• 115 kB port speed (ports E and F are prepared for "high-speed")</li><li>• Autodetection of sensors and motors</li><li>• Ports can be chosen freely when pairing motors</li></ul> <p>Six-axis Gyro Sensor:</p> <ul style="list-style-type: none"><li>• Three-axis accelerometer</li><li>• Three-axis gyroscope</li><li>• Able to report:<ul style="list-style-type: none"><li>• Gyroscope mode (three-axis)</li><li>• Accelerometer/tilt mode (three-axis)</li><li>• Gestures as <i>tap</i>, <i>free fall</i>, and <i>shake</i></li></ul></li></ul> <p>Three-button interface:</p> <ul style="list-style-type: none"><li>• Center Button:<ul style="list-style-type: none"><li>• Turns the Hub on/off</li><li>• Executes selected programs</li><li>• RGB light LEDs inside the button that communicate system status and are programmable</li></ul></li><li>• Left/Right Button:<ul style="list-style-type: none"><li>• Navigates programs on the Hub</li></ul></li></ul> <p>Speaker:</p> <ul style="list-style-type: none"><li>• Used for interface sounds</li><li>• Maximum sound quality is 12 bit 16 KHz (mono)</li></ul>



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### Wireless connectivity:

- Enables users to connect wirelessly to smart devices (phones, tablets, laptops, etc.) and LEGO® LPF2 remotes and wireless components using Bluetooth
  - Bluetooth Classic 4.2 (BTC)
  - Bluetooth Low Energy 4.2 (BLE)
- Connectivity to smart devices (laptops, tablets, etc.) is only supported with BTC
- Programs, sounds, and firmware can be updated wirelessly (BTC only)
- Minimum range: 10 meters (line-of-sight, without obstructions, indoors)
- The Hub can have a maximum of four BLE and one Bluetooth connections to compatible wireless components
- Connection interface button on the Hub enables users to turn wireless functionality on/off
  - RGB light LED indicates connectivity status ("Bluetooth on/off," "connected," "out of range")

### Power supply:

- Specially designed rechargeable battery is required
  - Charges inside the Hub via micro USB cable
  - Can be removed from the Hub without the use of tools
- RGB color LED indicates power/charging status

### Size and weight:

- Hub Weight 63 g (without battery)
- Hub Dimensions: L88.0 x W56.0 x H32.0 mm.

### System:

- The Hub is powered by a 100MHz M4 320 KB RAM 1M FLASH processor
- 32 MB of memory for programs, sound, and content
- Embedded MicroPython operating system
  - Provides an open platform for advanced users and third-parties

The LEGO® Education SPIKE™ app may not support all hardware features and functionalities.

