

Common NXT Sensors Used in FLL

Type	Picture	How it Works	Function	Uses	Notes
Rotation Sensor		Part of Servo Motor	Measures motor axle rotation (rotations or degrees)	Moving specified distances.	Commonly used by beginners for navigation. Exact starting location of robot is important for good results. Best for short, straight runs. Good +/- 1 degree
Timer		Inside brick – built in function of controller	Measures elapsed time (seconds)	Specify motor duration in terms of time. Time robot missions/runs.	When using time for duration, distance robot travels may vary based on battery levels. Low battery levels cause robot to move slower. Good for special situations when robot or motorized arm might get stuck.
Touch Sensor		Pressed button completes a circuit	Senses when pressed, or pressed and released (aka bumped) (True/False Value)	Limit switch Bumper Start button	Build a bumper to make contact surface larger. Use “pressed” for situations when the sensor won’t be released, like hitting a wall. Use “bumped” for start button so it doesn’t start before you’ve released the button.
Light Sensor		Shines light on surface and measures amount of light reflected back. Can also measure ambient (room) light.	Measures light either reflected light or ambient light. (% Value 0-100) Low values = dark High values = light	See marks on mat, count lines, stop at a line, follow a line, square up to a line. Sense when ambient light increases (light turns on in a room).	Best to calibrate before use. Shield to eliminate ambient light effects. Experiment to find optimal distance from surface for accurate readings. Look for both edges of a line when counting lines.
Ultrasonic Sensor		Emits a high frequency sound wave and calculates distance based on time it takes for the wave to return.	Measures distance to an object. (inches or cm)	Senses object without contacting. Used to avoid contact with object. Measure distance to an object. Motion detection.	Should be square to object to get good results. Other ultrasonic sensors in area could interfere. Can’t distinguish between objects. Good +/- 1 inch