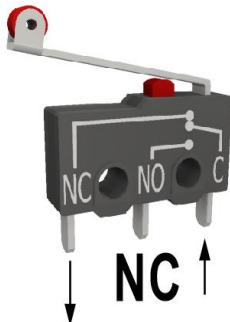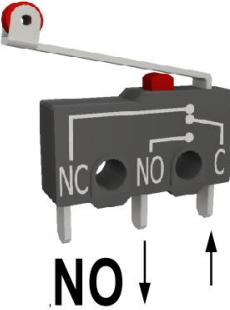# Robotics Glossary

NAME: _____     Date: _____     Section: _____
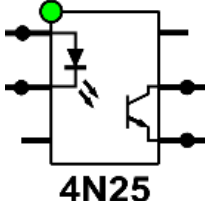
## *Vocabulary*

*The vocabulary below is used throughout all of our activities, lessons, and presentations for the dobot Magician*

| Vocabulary | Definition |
|---|---|
| Active sensors | Sensors that require an external power supply to operate. |
| Analog | A type of signal that has a range of values. A good example is an 8-bit light sensor with at least 256 different values. |
| Axis Movement | Movement of a robot's wrist in a straight line on the X, Y or Z axis. |
| Current limiting resistor | A resistor used in a circuit to limit the current going to a component such as a light emitting diode (LED) |
| Degrees of Freedom | The range and flexibility of motion.  Each added degree of freedom adds greater range of motion to the robot's tooling within its work area. Also see Roll, Pitch and Yaw. |
| Digital | Either on or off, no in between. Generally represented by a 1 or 0, or in electronics terms; 5 volts or 0 volts. |
| Drive system | The power or motors that are used to control the positioning of the robotic arm. Usually electric but may be hydraulic or pneumatic as well. |
| Electric drive system | A drive system used for high accuracy, repeatability and speed. Used to control motors, servos, or stepper motors. |
| End of arm tooling (EoAT) | The tooling added to the end of a robot's arm that allows it to perform specific operations. Also known as an end effector. |
| Function | A named section of a program that performs a task. It can also be considered a procedure or a routine and greatly simplifies otherwise complicated programs. |
| Handshaking | Handshaking is defined as safe communication between two or more, like or unlike, pieces of technology. |
| Home | A position within the robot's work envelope designated as a starting point for the operation. |
| Hydraulic drive systems | A drive system used for larger robots that require large amount of power. Linear movements are produced by hydraulic pistons while rotary is produced by rotary vanes. |

**DOBOT**

| Vocabulary | Definition |
|---|---|
| Input | A signal or value that is received by the robot. These values can be received from sources such as sensors, other devices, or other robots. |
| Joint movement | The movement of a robotic arms end effector defined by the movement of its individual joints. |
| Linear movement | The same as an axis movement; Movement of a robot's end effector in a straight line on the X, Y or Z axis. |
| Loop | The ability to repeat a given set of instructions or code a specific number of times |
| Main controller | The brain of the robotic system. Used to control the motion of and programming of the robot as well as control various inputs and outputs and communicate with other elements in a work cell. |
| Matrix | A rectangular array of parts, made of a finite number of rows and columns. a good example is an array of boxes on a pallet. |
| Nesting | Making parts fit most efficiently on a pallet or in a given space. |
| Normally closed | A digital switch, that when activated, turns OFF. Useful in handshaking when you want something to happen when an input signal turns off. The switch in the current state below will read as On or True.  If the switch is pressed, it will read as Off or False. |
| Normally open | A digital switch, that when activated, turns ON. Useful in handshaking when you want something to happen when an input signal turns on. The switch in the current state below will read as Off or False.  If the switch is pressed, it will read as On or True. |

| Vocabulary | Definition |
|---|---|
| Optical isolator | An electronic device that separates two unlike voltages or currents in a robotic communication system. It accomplishes this using an infrared LED and a light sensor embedded in a device.<br><br>4N25 |
| Output | An output produces an action. Some examples are motors, lights, and displays. An output can be a simple signal sent from a robot to another device such as a tool, machine or other robot. |
| Palletizing | An automated process that uses a robot to load and unload parts, containers, or boxes onto pallets for storage and shipping. |
| Passive sensor | Sensors that detect inputs from the physical environment without external power. |
| Payload | The size and weight of the material that a robotic arm can safely lift. |
| Pick and place | When a robot retrieves parts from one location and consistently places them in a new location. |
| Pitch | The degree of freedom of a robotic arms end effector around its Y axis. |
| Pneumatic drive system | A drive system used in smaller robots. Used to control rotary actuators or sliding joints. Typically used for high speed operations and limited movements. |
| Pull-down resistor | A resistor used in an electrical circuit to force a signal to be low when not activated (0v). This prevents a signal from floating in between a 1(5v) and 0(0v) in a digital circuit. |
| Pull-up resistor | A resistor used in an electrical circuit to force a signal to be High (5v) when not activated. This prevents a signal from floating in between a 1(5v) and 0(0v) in a digital circuit. |
| Ramping | To accelerate or decelerate the speed with which a robot moves. |
| Record | To save a position with a robot arm by actually moving the robot to that position and then storing the values of all the robot's joints. |
| Relative coordinates | A cartesian coordinate system where each successive point is relative to the point before it. Also known as incremental. |
| Relative positions | A system of recording positions where each point is relative in X, Y, and Z coordinates to all the other points in a program. |
| Robot accuracy | How close a robot's actual movement is to a given position. |
| Robot repeatability | A robot's ability to return to a given position multiple times. |
| Robotic arm | The positionable part of the the robot that is used to locate and position the end of arm tooling. |

![DOBOT]

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|---|---|
| Roll | The degree of freedom of a robotic arms end effector around its Z axis |
| Roll angle | Adjusting this angle allows a robot's end of arm tooling to line up and nest parts on a pallet. |
| Sensor | Inputs that provide feedback and bring in a variety of data into the robot. |
| Suction | The gripper or end of arm tooling that uses vacuum and a flexible suction cup to pick up parts easily. |
| Teach | To save a position with a robot arm by typing in an X, Y and Z value and storing the position. |
| Teach pendant | A handheld device used to manually control, program, and troubleshoot a robotic arm without the need for a full control terminal. |
| Tool center point | The X, Y and Z value recorded or taught in robotics that represents where the work is actually being done in space by the robot's end of arm tooling. (TCP) |
| Touch up | To easily correct or round saved points in a robotics program by manually adjusting X, Y, and Z values in the control software. |
| Vacuum | The creation of negative pressure that allows a robot to pick up an object easily. |
| Variable | A changeable quantity in a program that can be represented by a word or a letter. Variables can be assigned, changed, or referenced throughout a program. |
| Work cell | The complete environment around a robot. May include tools, machines and/or other robots. |
| Work envelope | Defined as the range and area each robot may work within. |
| Yaw | The degree of freedom of a robotic arms end effector around its Y axis |