Color Sequence Program

FLL® Programming

2019
Prerequisites

• Basic computer knowledge.
• A fundamental understanding of EV3 Mindstorms® software.
• Familiar with creating My Blocks in the EV3 Mindstorms® software.

Recommended

• An EV3 Mindstorms® Brick or robot for testing.
A “master sequence program” combines all missions in the desired run order into a single program.

This reduces time spent in Base by not requiring technicians to navigate, find and select the next program to run.

Most FLL® teams create separate programs for missions (or trips) out of Base. These take time to find and run. *Time in Base is time not scoring.*
There are many types of sequencers, four are:

- Basic Loop/Switch Sequencer
- Button Sequencer
- Color Scan Sequencer
- Numeric Sequencer
Assumptions

• Using the EV3 Gyro to navigate.
• Using the EV3 default ports for motors and sensors.
  • If your robot uses other than default ports you must change the port setting each time you insert a programming blocks with port setting.
Getting Started

General items
Variable, Compare and Text blocks overview

Variable blocks write and read data based on the settings.

Compare block compares two numbers and returns true or false based on the settings.

Receives multiple text inputs and combines them.
Switch block basics

Tabbed View

Flat View

Add path to Switch

Switch to Flat View

Add path to Switch

Switch to Tabbed View
Properly commenting your programs not only helps others to understand what the program is about, but also helps you remember what you did and to locate sections of the program quickly.
The gyro calibrate (GyroCal) My Block helps to reduce gyro drift.

This version works with new and old models of EV3 gyros.

The gyro calibrate only needs ran once at the beginning. Robot must be sitting on the surface it will be running on and cannot be moving during the reset.

The GyroCal My Block displays the gyro reading on EV3 screen so you can check for drift. If still drifting rerun the program.
1. Insert an Infrared Sensor block set to the same port (port 2) as your Gyro.
2. Insert a Gyro sensor block set to port 2, and Measure ➔ Angle.
3. Insert a Wait block set to Time and 1 second.
4. Insert a Loop block set to Brick Buttons ➔ Compare, Brick Button ID: 2, and State: 2.

The EV3 Brick indicates an error on the Infrared Sensor block. This is correct and required for the program to work.
5. Inside the Loop block, insert a Gyro sensor block set to port 2 and Measure ➔ Angle.

6. Insert a Text block. In A, type Gyro followed by a space. Drag a wire from the Gyro sensor block and place it in B input of the Text block.

8. Connect a wire from the Text block output (=) to the Display Text input.

9. Convert to My Block with no parameters.
Color Sequencer
Color Sequencer

• A color sequencer allows you to run any program in the sequencer in any order, at any time, without navigating through a menu.

• Programs are selected by scanning a color.
  • Color sensors read the LEGO® brick colors best, so a “key” made of LEGOS® works the best.
Color Sequencer Overview
(Flat View*)

*Flat view displays all Switch paths.
Color sequencer (Tab View) build sections
Build 1: Scan Color My Block

• The Scan Color My Block programs:
  • Prompts on the EV3 screen to scan color.
  • Resets the gyro to zero.
  • Reads the color and sets the Variable to the color scanned.
Build ①: Scan Color My Block

1. Insert a Display block set to Text - Grid.
2. Set Clear Screen to True, column to 5, Row to 2, color to false, and text size to 2.
3. Enter SCAN into the Text block.
Build ①: Scan Color My Block

4. Insert a second Display block set to Text - Grid.
5. Set Clear Screen to False, column to 5, Row to 4, color to false, and text size to 2.
6. Enter COLOR into the Text block.
7. Insert a Gyro sensor block set to Reset and port 2.
8. Insert a Wait block set to Brick Buttons - Compare.
10. Insert a Color sensor block set to Measure Color.
11. Insert a Variable block named color set to Write - Numeric.
12. Drag a wire from the Color sensor output to the Variable block input.
13. Convert to My Block without parameters named Scan.
The Selector My Block displays the color scanned.

Allows the technician to run the program or return to scan a different color.
Build ②: Selector My Block

1. Insert a Wait block set to Brick Buttons - Compare.

2. Set Set of Brick button IDs to [2] and State to 2.
3. Insert a Loop block set to Numeric.
4. Drag a wire from the Wait block output to the Loop block input.
5. Change the Switch path numbers to 1 and 2.
6. In path 1 insert a Loop Interrupt block set to Missions.
7. In path 2 insert a Gyro block set to Reset and port 2.
8. Convert to My Block with no parameters named Continue.
Build ③: Missions area
1. Insert a GyroCal My Block.
2. Insert a Loop block named Seq.
3. Inside the Seq Loop block insert a Loop block named Missions set to Numeric.
4. Inside the Mission loop, insert a Scan My Block.
5. Insert a Variable block set to Read and color.
6. Drag a wire from the Variable output to the Loop input.
7. Inside the Mission loop, insert a Switch block set to Tab view.
8. Select the + five times for a total of six paths.
9. Number the Switch paths 1 through 6.
Build ③: Missions area

10. Inside each Switch path, insert a Display block. Set Clear Screen to True, column to 2, Row to 2, color to false, and text size to 2.

11. Insert a Continue My Block in each path.
12. Enter the color in each path as listed.
[1] Black
[2] Blue
[4] Yellow
[5] Red
13. Insert a Display block set to Reset Screen.
Everything is awesome!

- Emmet Brickowski

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