



C:\ESDA-Lab\WRO-ARC\main.vi

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Connector Pane

main.vi



main.vi

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Front Panel

INDICATORS

Hokuyo Init Delete Files Cubes 3 Flag

QR INDICATOR

QR Attempts QR BREAK

Data

ALGORITHM

START ALGO

Algorithm log

MovementCounter

Route Size

Movement

ActionCounter

Action

Actions:

- (0) Finish
- 1) Front
- 2) Back
- 3) Right
- 4) Left
- 5) Calibrate
- 6) Take and Hold
- 7) Take and Hold
- 8) Place cube
- 9) Color Check
- 10) Park
- 11) No Calibration

Colors:

- 10) Blue
- 11) Green
- 12) Yellow
- 13) Red
- 14) Orange
- 15) Unknown

BASH CLEANUP SCRIPT

TERMINAL OUTPUT

QR Footage

ROUTE FILES CHECK

CHECK route1.csv

CHECK route2.csv

ROUTE READING

Route

Route Size Array

Color Footage

Colors String

HOKUYO CALIBRATION

status code source

hokuyo

COLOR BOX

COLOR CUBE

hokuyo instance

NATIONAL INSTRUMENTS LabVIEW Home and Student Edition

STD ERROR

RETURN VALUE

0

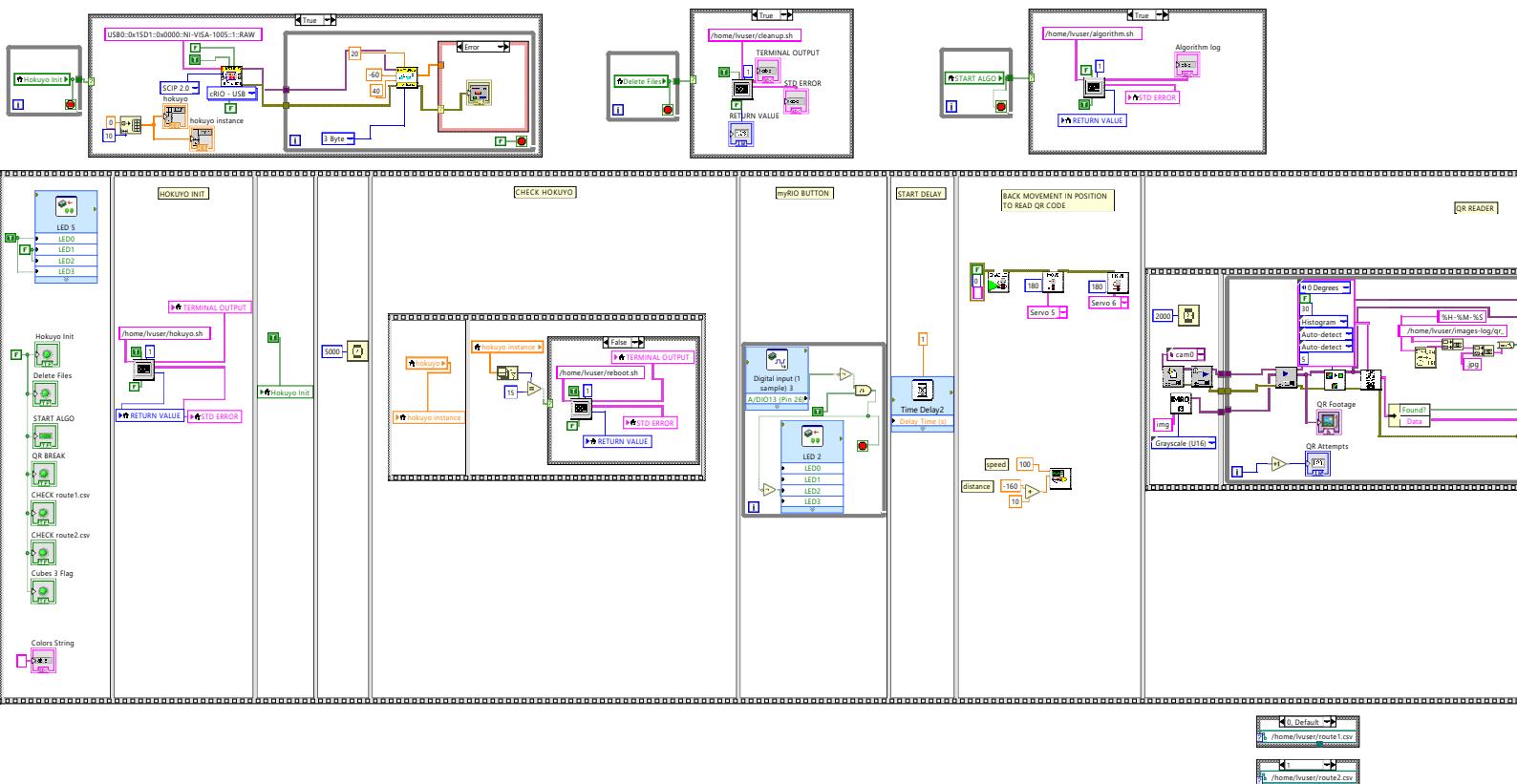
main.vi

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Block Diagram



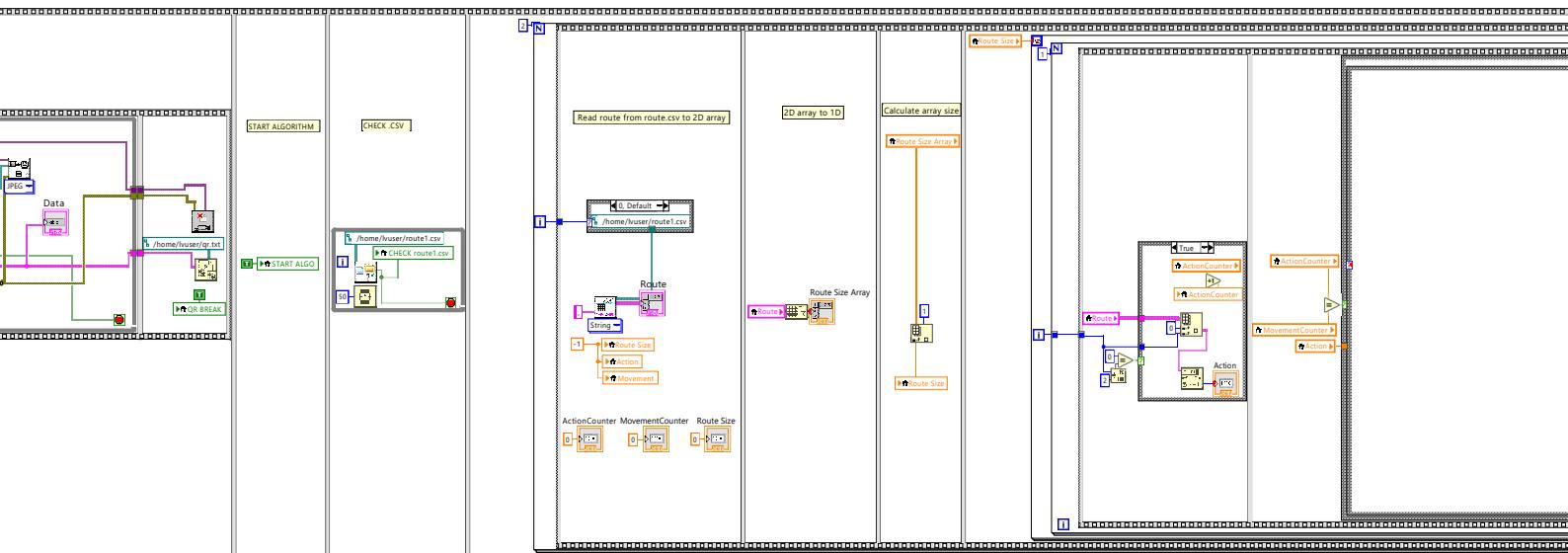


main.vi

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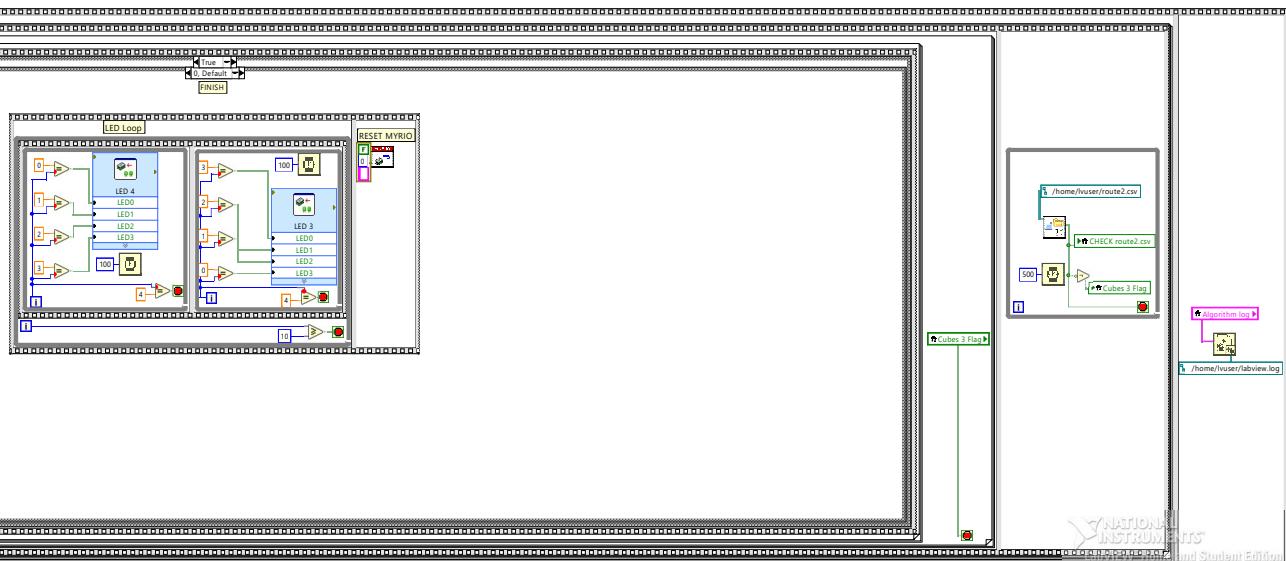


main.vi

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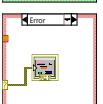
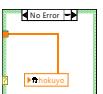
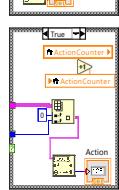
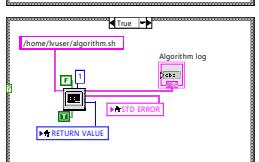
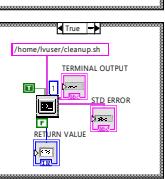
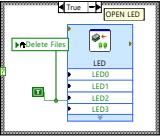
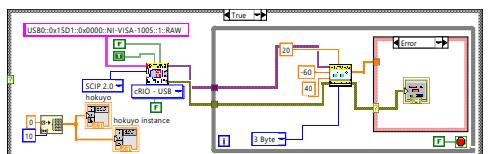
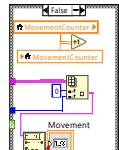
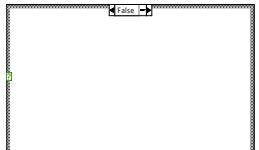
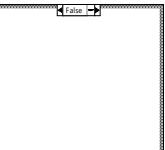
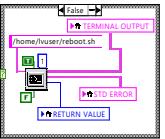
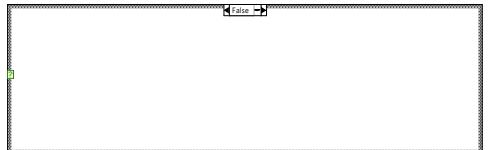
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Home/Student Edition

main.vi

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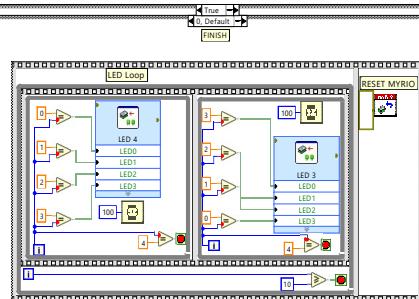
Printed on 10/24/2021 at 1:01 PM



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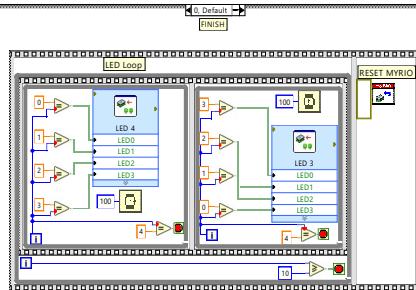




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[BACK MOVEMENT]

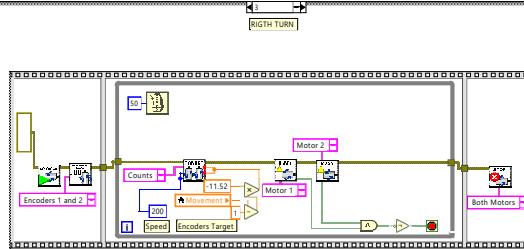




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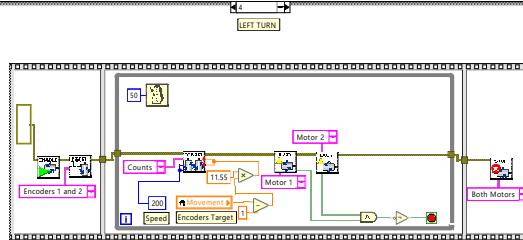




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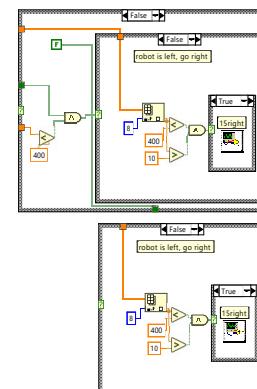
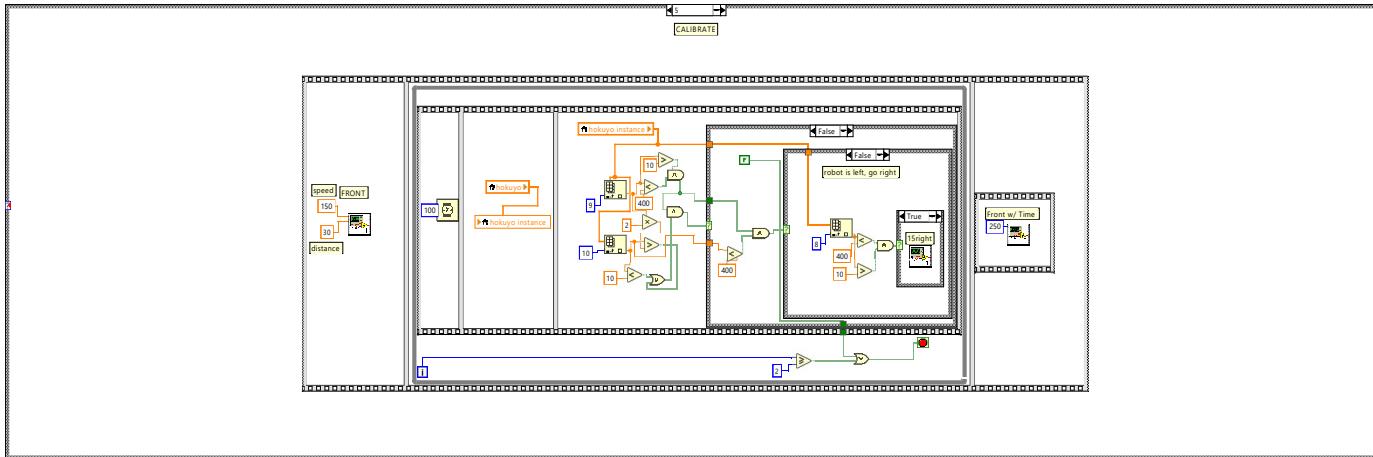


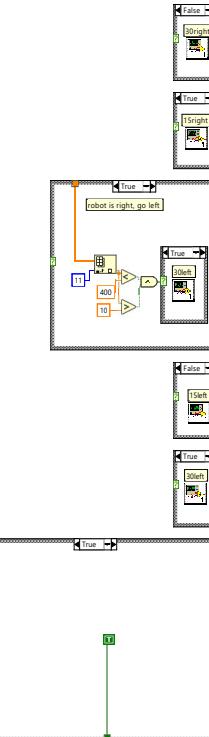


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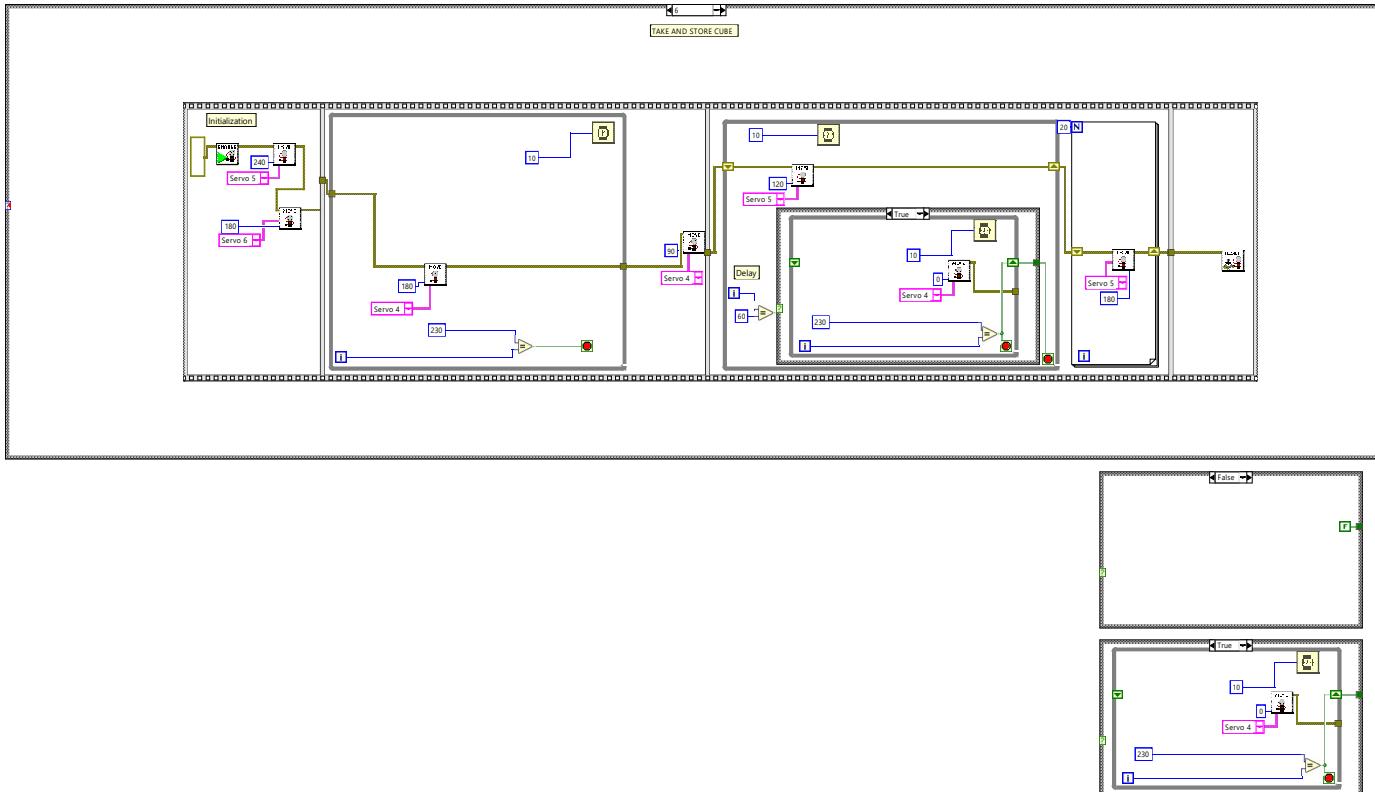




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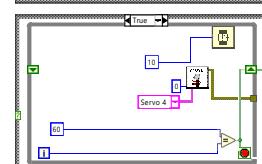
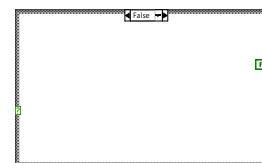
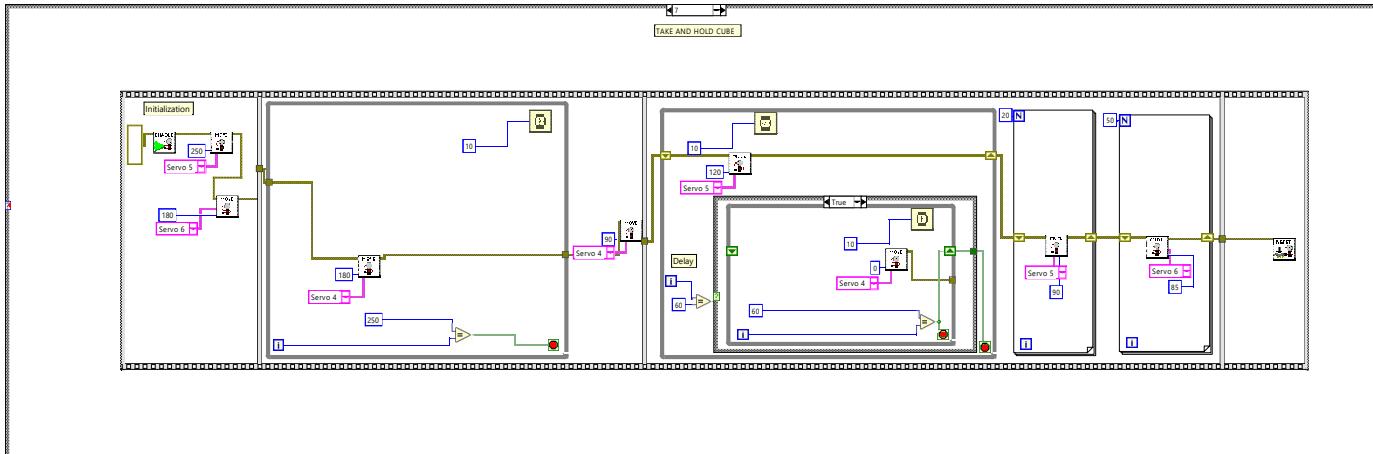
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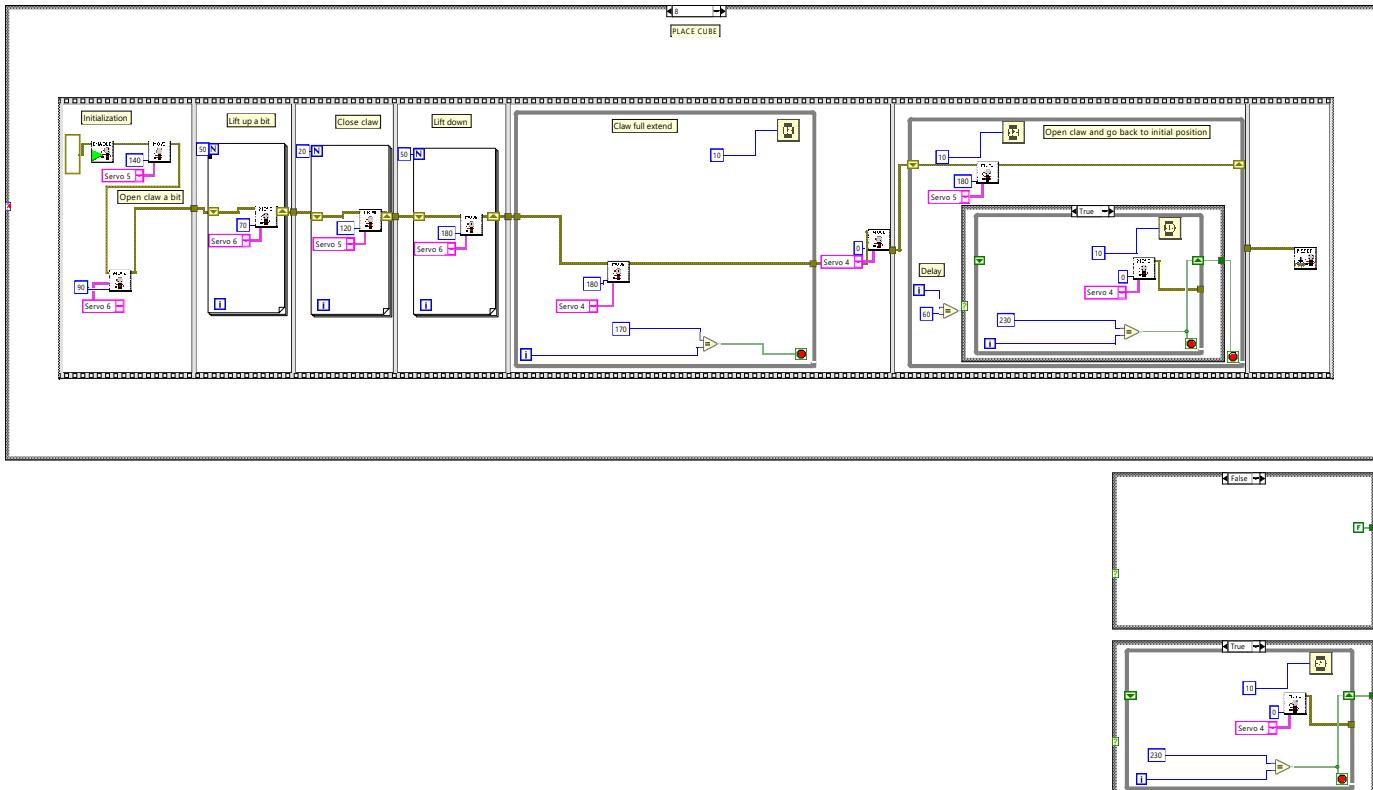




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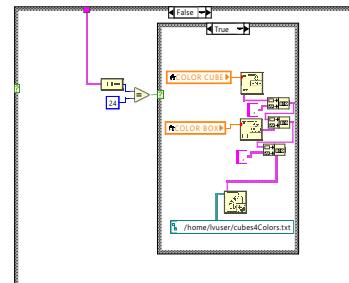
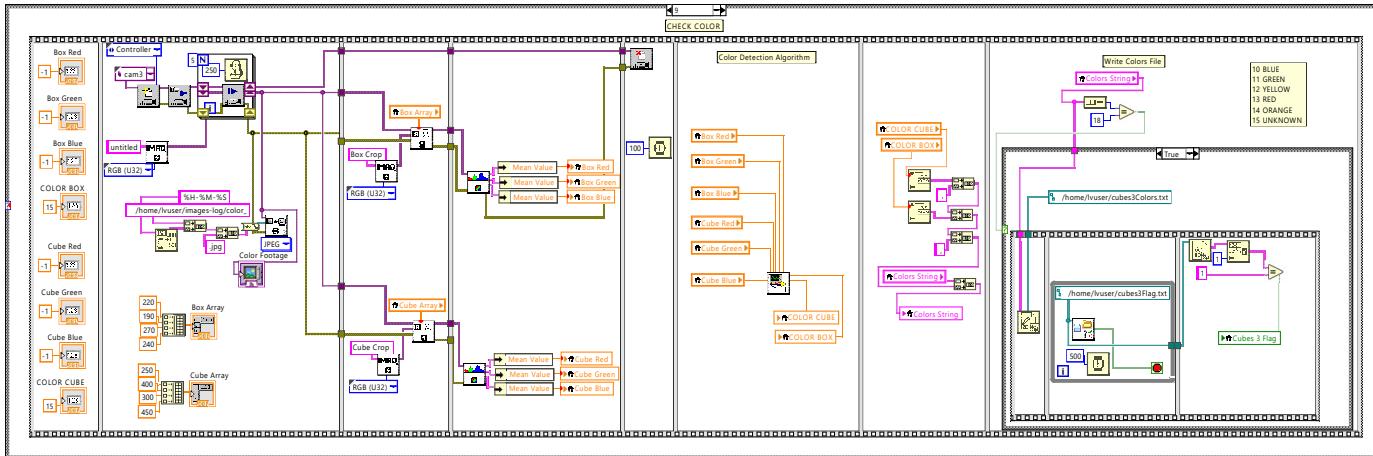




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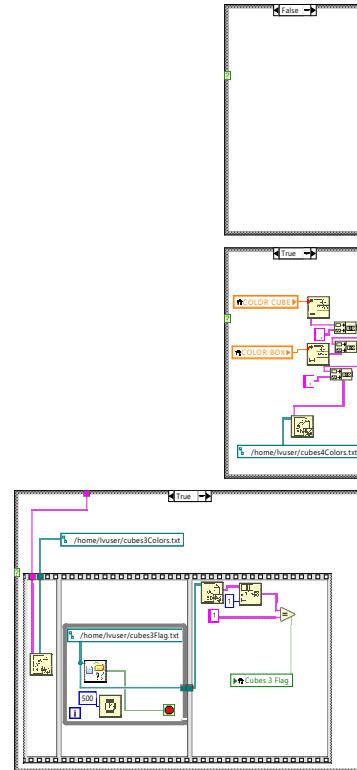




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List of SubVIs and Express VIs with Configuration Information



myRIO v1.0 Timer IRQ Info FGV.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\IRQ\vis\myRIO v1.0 Timer IRQ Info FGV.vi



myRIO v1.0 Reset FPGA.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\myRIO v1.0 Reset FPGA.vi



main.vi

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IO Manager.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\Utilities\vis\IO Manager.vi



myRIO v1.0 Configure IO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\Resource Manager\vis\myRIO v1.0 Configure IO.vi



myRIO v1.0 Close.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\myRIO v1.0 Close.vi



Check if File or Folder Exists.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Utility\libraryn.llb\Check if File or Folder Exists.vi



NI_Vision_Acquisition_Software.lvlib:IMAQdx Grab2.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\driver\IMAQdx.llb\IMAQdx Grab2.vi



DIO Channels List.ctl

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\DIOD\typesdefs\DIOD Channels List.ctl



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Cell Sample Size.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Instrument.llb\Cell Sample Size.vi



Cell Filter Mode.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Instrument.llb\Cell Filter Mode.vi



IMAQ Write File 2

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Files.llb\IMAQ Write File 2.vi



DIO Channels Enum.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\DIOD\types\enum\enum\enum.vi



NI_Vision_Development_Module.llb:IMAQ Read QR Code

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Instrument.llb\IMAQ Read QR Code.vi



NI_Vision_Acquisition_Software.llb:IMAQdx Configure Grab.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\driver\IMAQdx.llb\IMAQdx Configure Grab.vi



IMAQ Write JPEG File 2

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Files.llb\IMAQ Write JPEG File 2.vi

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**TETRIX_Enable_Servo_Controller_myRIO.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Servo_Expansion_Controller\TETRIX_Enable_Servo_Controller_myRIO.vi

**NI_Vision_Development_Module.lvlib:IMAQ ExtractSingleColorPlane**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Color.llb\IMAQ ExtractSingleColorPlane

**QR Code Search Options.ctl**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Instrument.llb\QR Code Search Options.ctl

**Demodulation Mode.ctl**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Instrument.llb\Demodulation Mode.ctl

**Image Type**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Image Controls.llb\Image Type

**subTimeDelay.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\express\express execution control\TimeDelayBlock.llb\subTimeDelay.vi



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TETRIX_Set_Servo_Position_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Servo_Expansion_Controller\TETRIX_Set_Servo_Position_myRIO.vi



IMAQ Create

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Basics.llb\IMAQ Create



myRIO v1.0 Read DIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\DI\vis\myRIO v1.0 Read DIO.vi



Hardware Version Enum.ctl

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\Utilities\typedefs\Hardware Version Enum.ctl



TETRIX_Set_Motor_Target(s)_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Set_Motor_Target(s)_myRIO.vi



Is FPGA Ref Available.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\Utilities\vis\Is FPGA Ref Available.vi



correction-right-30(SubVI).vi

C:\ESDA-Lab\WRO-ARC\correction-right-30(SubVI).vi



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myRIO Generic Hardware Reference.ctl

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\Utilities\typedefs\myRIO Generic Hardware Reference.ctl



myRIO v1.0 IRQ Info FGV.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\IRQ\vis\myRIO v1.0 IRQ Info FGV.vi



myRIO v1.0 ISR Agent.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\IRQ\vis\myRIO v1.0 ISR Agent.vi



TETRIX_Reset_Encoders_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Reset_Encoders_myRIO.vi



TETRIX_Read_Motor_Busy_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Read_Motor_Busy_myRIO.vi



front-back(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-back(SubVI).vi



correction-left-15(SubVI).vi

C:\ESDA-Lab\WRO-ARC\correction-left-15(SubVI).vi



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TETRIX_Stop_Motors_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Stop_Motors_myRIO.vi



correction-left-30(SubVI).vi

C:\ESDA-Lab\WRO-ARC\correction-left-30(SubVI).vi



correction-right-15(SubVI).vi

C:\ESDA-Lab\WRO-ARC\correction-right-15(SubVI).vi



TETRIX_Enable_DC_Controller_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Enable_DC_Controller_myRIO.vi



front-time(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-time(SubVI).vi



Hokuyo URG Series.lvlib:Initialize-cRIO-USB.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\instr.lib\Hokuyo URG Series\Public\Initialize-cRIO-USB.vi



Error Cluster From Error Code.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Utility\error.llb\Error Cluster From Error Code.vi

main.vi

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**myRIO v1.1 Open.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\myRIO v1.1 Open.vi

**VariantType.lvlib:GetNumericInfo.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Utility\VariantDataType\GetNumericInfo.vi

**FPGA Ref Manager.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\Utilities\vis\FPGA Ref Manager.vi

**Configuration Manager.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\Utilities\vis\Configuration Manager.vi

**NI_Vision_Development_Module.lvlib:IMAQ Extract**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Image Manipulation.llb\IMAQ Extract

**Hokuyo URG Series.lvlib:Initialize.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\instr.lib\Hokuyo URG Series\Public\Initialize.vi



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NI_Vision_Acquisition_Software.lvlib:IMAQdx Snap2.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\driver\IMAQdx.llb\IMAQdx Snap2.vi



NI_Vision_Acquisition_Software.lvlib:IMAQdx Camera Control Mode.ctl

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\driver\IMAQdx.llb\IMAQdx Camera Control Mode.ctl



NI_Vision_Development_Module.lvlib:IMAQ ColorHistogram

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\Color Processing.llb\IMAQ ColorHistogram



color-detection(SubVI).vi

C:\ESDA-Lab\WRO-ARC\color-detection(SubVI).vi



NI_Vision_Acquisition_Software.lvlib:IMAQdx Open Camera.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\driver\IMAQdx.llb\IMAQdx Open Camera.vi



IMAQdx.ctl

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\userdefined\High Color\IMAQdx.ctl



Hokuyo URG Series.lvlib:Acquire Data.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\instr.lib\Hokuyo URG Series\Public\Data\Acquire Data.vi



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DIO.lvlib:Write.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Instrument Drivers\Onboard IO\DIO\vis\Write.vi



DIO.lvlib:DIO Reference.ctl

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Instrument Drivers\Onboard IO\DIO\typesdefs\DIO Reference.ctl



Utilities.lvlib:Reset myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Instrument Drivers\Utilities\vis\Reset myRIO.vi



System Exec.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Platform\system.llb\System Exec.vi



myRIO v1.1 Open DIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\DIO\vis\myRIO v1.1 Open DIO.vi



myRIO v1.0 Write DIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\myRIO v1.0\DIO\vis\myRIO v1.0 Write DIO.vi



DIO.lvlib:Read.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Instrument Drivers\Onboard IO\DIO\vis\Read.vi

main.vi

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**NI_Vision_Acquisition_Software.lvlib:IMAQdx Close Camera.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\vision\driver\IMAQdx.llb\IMAQdx Close Camera.vi

**myRIO v1.0 Reference.ctl**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\Utilities\typesdefs\myRIO v1.0 Reference.ctl

**Generic FPGA Reference.ctl**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\myRIO\Common\Instrument Driver Framework\Utilities\typesdefs\Generic FPGA Reference.ctl

**TETRIX_Reset_Servo_Controller_myRIO.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Servo_Expansion_Controller\TETRIX_Reset_Servo_Controller_myRIO.vi

**Read Delimited Spreadsheet.vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Utility\file.llb\Read Delimited Spreadsheet.vi

**Read Delimited Spreadsheet (string).vi**

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Utility\file.llb\Read Delimited Spreadsheet (string).vi



Home/Student Edition

front-back(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-back(SubVI).vi

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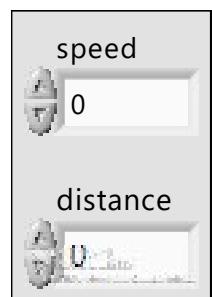
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Connector Pane

front-back(SubVI).vi

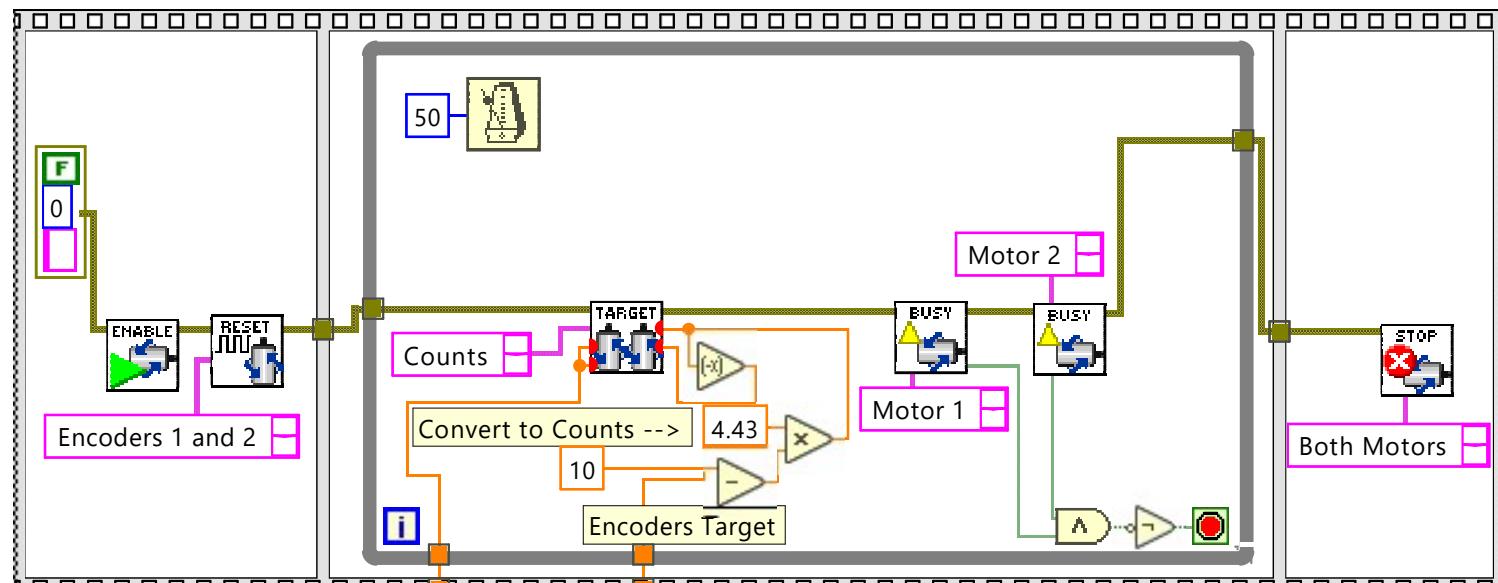


Front Panel





Block Diagram



distance

1.23

speed

1.23



Home/Student Edition

front-back(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-back(SubVI).vi

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List of SubVIs and Express VIs with Configuration Information



TETRIX_Set_Motor_Target(s)_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Set_Motor_Target(s)_myRIO.vi



TETRIX_Reset_Encoders_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Reset_Encoders_myRIO.vi



TETRIX_Read_Motor_Busy_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Read_Motor_Busy_myRIO.vi



TETRIX_Stop_Motors_myRIO.vi

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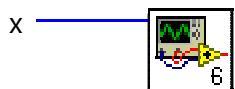
TETRIX_Enable_DC_Controller_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Enable_DC_Controller_myRIO.vi

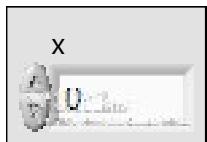
Iconified Cluster Constants



Connector Pane

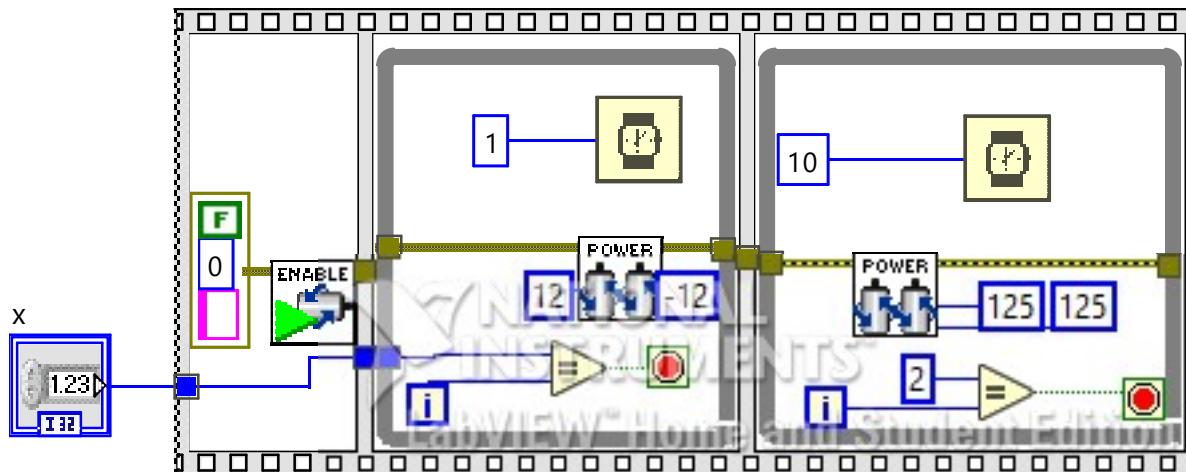
front-time(SubVI).vi

Front Panel





Block Diagram



List of SubVIs and Express VIs with Configuration Information

**TETRIX_Set_Motor_Power(s)_myRIO.vi**

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front-time(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-time(SubVI).vi

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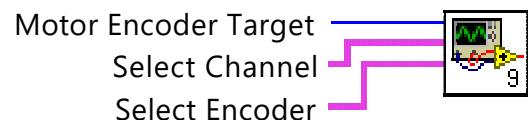
TETRIX_Enable_DC_Controller_myRIO.vi

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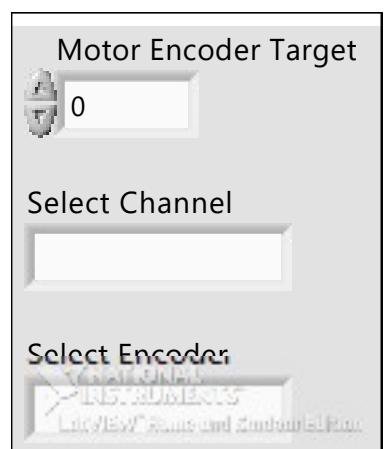
Iconified Cluster Constants



Connector Pane

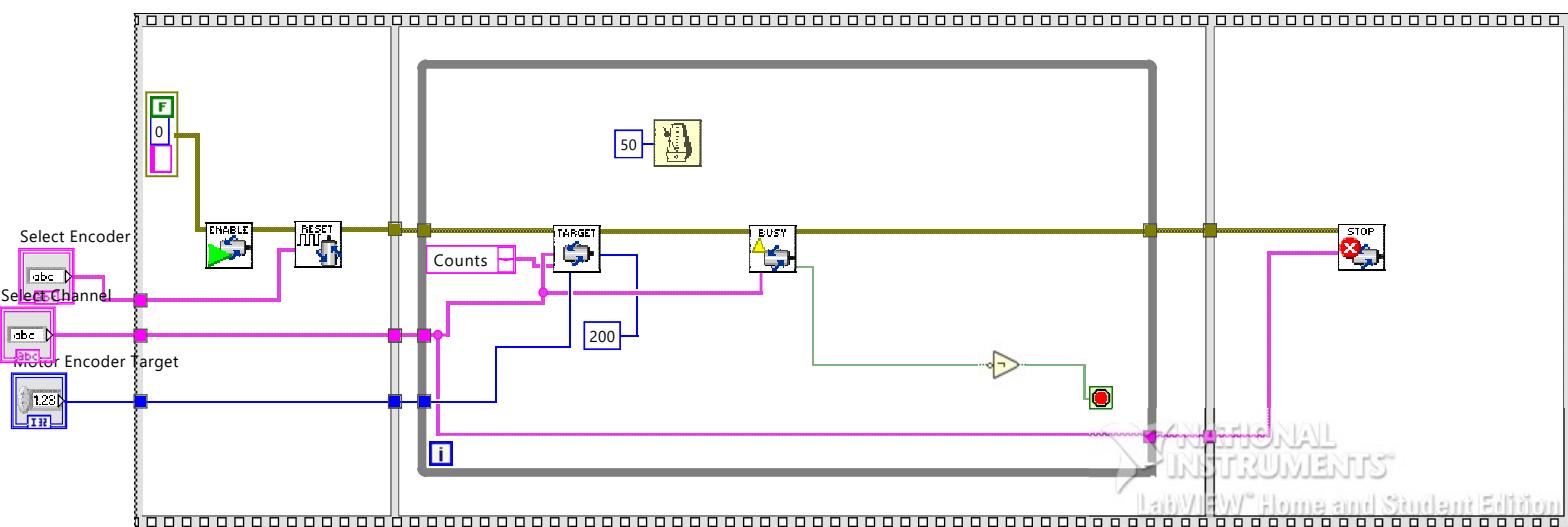
back-turn(SubVI).vi

Front Panel





Block Diagram



List of SubVIs and Express VIs with Configuration Information

**TETRIX_Reset_Encoders_myRIO.vi**

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Home/Student Edition

back-turn(SubVI).vi

C:\ESDA-Lab\WRO-ARC\back-turn(SubVI).vi

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TETRIX_Read_Motor_Busy_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Read_Motor_Busy_myRIO.vi



TETRIX_Set_Motor_Target_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Set_Motor_Target_myRIO.vi



TETRIX_Stop_Motors_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Stop_Motors_myRIO.vi



TETRIX_Enable_DC_Controller_myRIO.vi

C:\Program Files (x86)\National Instruments\LabVIEW 2016\vi.lib\Pitsco Education\TETRIX Expansion Controller Toolkit for myRIO\Motor_Expansion_Controller\TETRIX_Enable_DC_Controller_myRIO.vi

Iconified Cluster Constants

correction-left-15(SubVI).vi



C:\ESDA-Lab\WRO-ARC\correction-left-15(SubVI).vi

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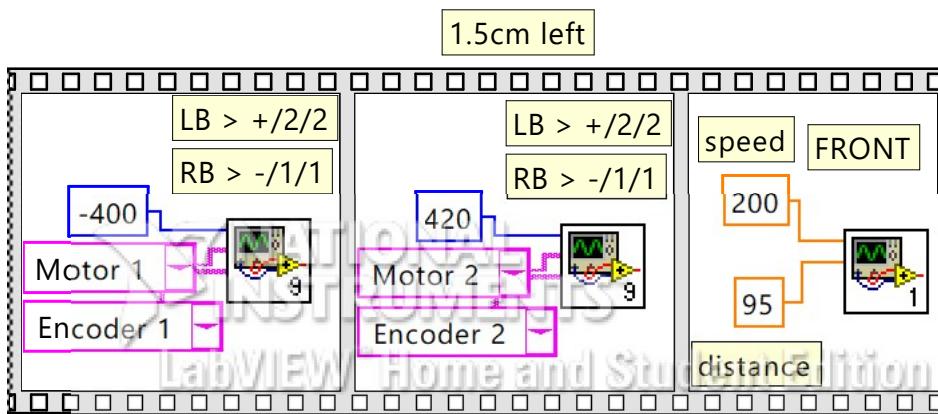
Connector Pane

correction-left-15(SubVI).vi

Front Panel



Block Diagram





Home/Student Edition

correction-left-15(SubVI).vi

C:\ESDA-Lab\WRO-ARC\correction-left-15(SubVI).vi

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List of SubVIs and Express VIs with Configuration Information



front-back(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-back(SubVI).vi



back-turn(SubVI).vi

C:\ESDA-Lab\WRO-ARC\back-turn(SubVI).vi

Iconified Cluster Constants

correction-left-30(SubVI).vi



C:\ESDA-Lab\WRO-ARC\correction-left-30(SubVI).vi

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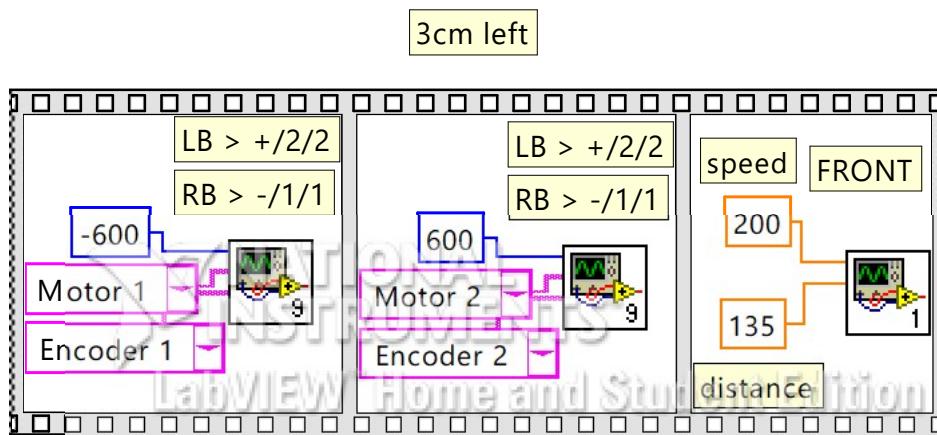
Connector Pane

correction-left-30(SubVI).vi

Front Panel



Block Diagram





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correction-left-30(SubVI).vi

C:\ESDA-Lab\WRO-ARC\correction-left-30(SubVI).vi

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List of SubVIs and Express VIs with Configuration Information



front-back(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-back(SubVI).vi



back-turn(SubVI).vi

C:\ESDA-Lab\WRO-ARC\back-turn(SubVI).vi

Iconified Cluster Constants



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correction-right-15(SubVI).vi

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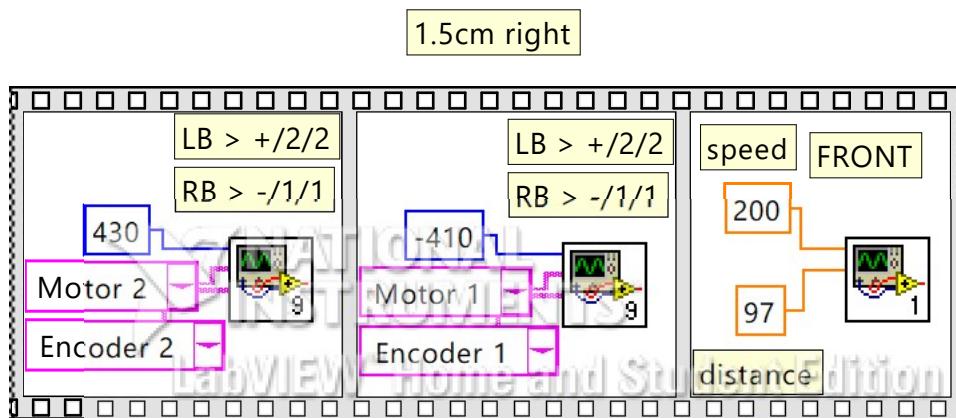
Connector Pane

correction-right-15(SubVI).vi

Front Panel



Block Diagram





Home/Student Edition

correction-right-15(SubVI).vi

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List of SubVIs and Express VIs with Configuration Information



front-back(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-back(SubVI).vi



back-turn(SubVI).vi

C:\ESDA-Lab\WRO-ARC\back-turn(SubVI).vi

Iconified Cluster Constants



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correction-right-30(SubVI).vi

C:\ESDA-Lab\WRO-ARC\correction-right-30(SubVI).vi

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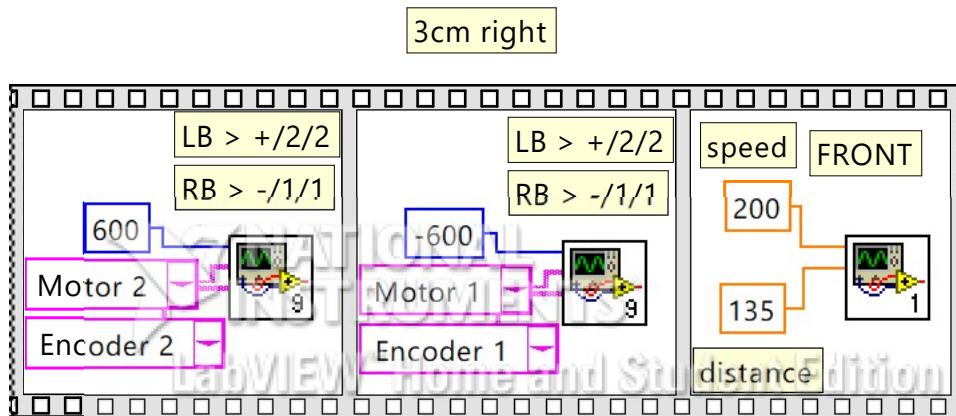
Connector Pane

correction-right-30(SubVI).vi

Front Panel



Block Diagram





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correction-right-30(SubVI).vi

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List of SubVIs and Express VIs with Configuration Information



front-back(SubVI).vi

C:\ESDA-Lab\WRO-ARC\front-back(SubVI).vi



back-turn(SubVI).vi

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Iconified Cluster Constants



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color-detection(SubVI).vi

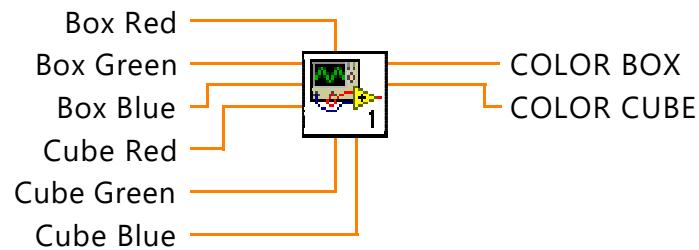
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Connector Pane

color-detection(SubVI).vi





Home/Student Edition

color-detection(SubVI).vi

C:\ESDA-Lab\WRO-ARC\color-detection(SubVI).vi

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Front Panel

Box Red	COLOR BOX
0	0
Box Green	COLOR CUBE
0	0
Box Blue	
0	
Cube Red	
0	
Cube Green	
0	
Cube Blue	



Home/Student Edition

color-detection(SubVI).vi

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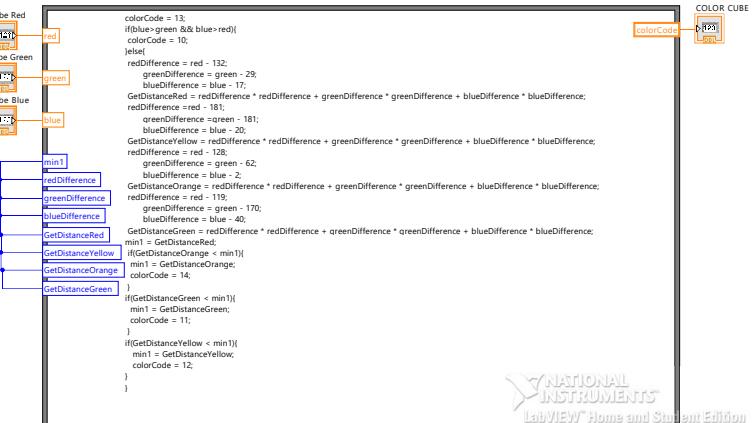
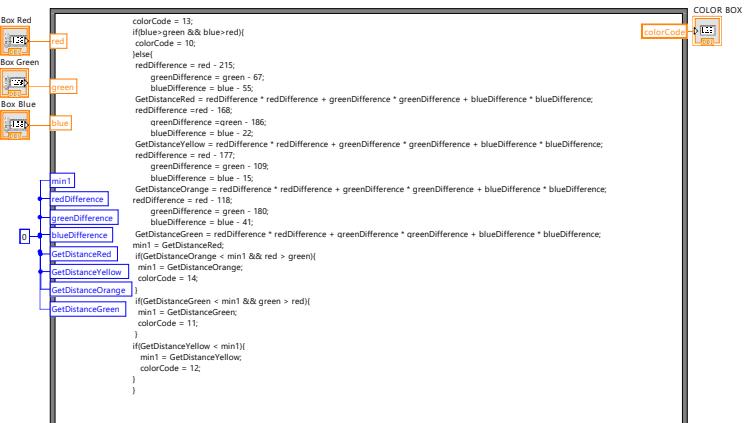
color-detection(SubVI).vi

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Block Diagram



Iconified Cluster Constants