Bronky Documentation

Release 2018.8.1

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Aug 09, 2018

Setup

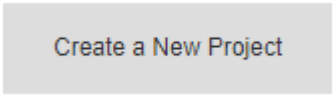
This is Documentation for the Bronky bot by the south doyle robotics team

- Our team home page : https://soknorobo.com
- Bronky GitHub : https://github.com/Atikul10152002/Bronky

CHAPTER 1

Creating a Project

- First Navigate to RobotMesh Studio
- Click on *Create a New Project* button



- From the pop up list of target click on *VEX EDR* and press select button

- Now for Language selection you can choose either *Blockly* or *Python* [Recommended] and click select

- Now Name your program something that suits your Personality and click Create

`Hooray!!!`

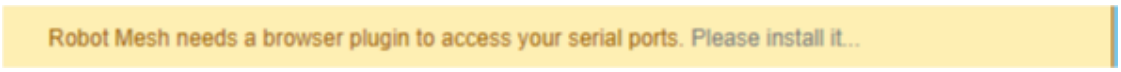
You have a VEX EDR project you can mess with

CHAPTER 2

Installing plugins

To install the plugins follow the guide at bottom of your screen or you can follow along with the guide

- Click on the "Please install it. . . " link on your project IDE.

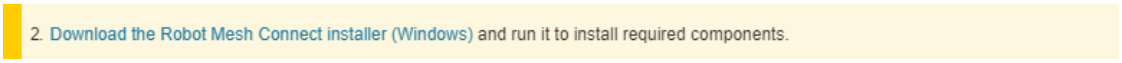
  

  `A screen will popup listing components to install`

- On the popup screen click on the first link to "install the Robot Mesh Connect extension for your browser

  [Tested browser: Chrome] <– click for extension

- Click on Add extension to add it to your browser
- Now click on the second link to Download the Robot Mesh Connect installer

  Links for Robot Mesh Connect installer: Windows | Mac OSX | Ubuntu 12.04 32-bit | Ubuntu 12.04 64-bit | Ubuntu 14.04 32-bit | Ubuntu 14.04 64-bit | Ubuntu 16.04 32-bit | Ubuntu 16.04 64-bit

  - Double click on the downloaded file to run and install the required components

- Refresh your browser tab

You may need to update the cortex firmware and install the drivers

Follow the next OPTIONAL steps if this is your first install

CHAPTER 3

[OPTIONAL] Firmware & drivers

`All drivers and firmwares are availavle` here

- Only for Windows:
  - VEXnet Serial USB Driver
  - VEXnet Firmware Upgrade Utility
  - VEXnet Key 2.0 Firmware Upgrade Utility

CHAPTER 4

Pair Joystick and Cortex

The Joystick must first be paired to the Cortex Microcontroller before they will work using the VEXnet Keys. Pairing requires a USB A-A Cable and a VEX 7.2V Battery. This process must be completed each time you use a Joystick or Cortex with a new mate. A Joystick can only communicate with a Cortex that it has been paired with. During the Pairing Process, the ID from the Cortex is transferred to the Joystick; thus mating the two units together.

- Start with the Cortex and Joystick turned OFF.
- Connect the Cortex to the Joystick using a USB A-A Cable.
- Connect the 7.2V Robot Battery to the Cortex.
- Power up only the Cortex.
- A successful tether is indicated by a Solid Green VEXnet LED on both the Joystick and the Cortex
- The Solid Green VEXnet LED must remain ON on both units at the same time for a minimum of 5 seconds.
- Disregard the other LEDs as you are only interested in the VEXnet LED.
- Pairing may take up to one minute to complete.
- Once the units have finished pairing, turn OFF the Cortex.
- Disconnect the USB A-A Cable from both units.
- Disconnect the 7.2V Robot Battery from the Cortex.
- Connect the USB KEY and trun on both the Cortex and Joystick to pair them wirelessly.

CHAPTER 5

Download Code to Cortex

- Click the dropdown arrow beside the run button in your RobotMeshStudio IDE
- Select the option - “Download: build program and download only”
- Now click the Download button situated where the run button used to be

CHAPTER 6

RobotMesh API

To program the VEX EDR (Cortex) controller:

- Configure the peripherals connected to the controller in the "config" region. Create device objects in the vex module, passing the port number if necessary.

```
import sys
import vex
#region config
green_led = vex.DigitalOutput(1) # LED on Digital #1
switch    = vex.DigitalInput(2)  # Switch on Digital #2
motor     = vex.Motor(1)          # Motor on Motor #1
#endregion
```

- Write Python code invoking methods on peripheral objects or the main module.

```
green_led.on()       # Turn the LED on
if switch.is_on():  # Check whether the switch is on
    print "Switch is on!"
motor.run(50)        # Run the motor at 50% power
sys.sleep(1)         # Sleep for 1 sec
```

- For details, see the full docs for the vex module

CHAPTER 7

Port Errors

For all port errors

- Unplug and re-plug the USB cable

CHAPTER 8

Diagnostics Information

Refer to the following chart for Joystick and Cortex LED patterns and meanings.

Joystick [5]	Robot	VEXnet	Game	
		Medium (yellow)		Initialize - Looking for PC or Tether Mate
		Slip (yellow)		Startup - Looking for USB Key
		Fast (yellow)		Linking - Searching for VEXnet Mate
		Fast (green)		Linked
		Slow (green / yellow)		Linked - Data quality reduced
		Slow (green / red)		Linked - Poor Data quality reduced
		Solid (green)		Tethered to Mate or PC
		Slow (red) single blink		Fault: Lost Link - Searching for VEXnet Mate
		Slow (green)		Downloading User Code [1]

Note 1: Does not apply to ROBOTC User Code Downloads

Joystick [5]	**Robot** [1]	VEXnet	Game	
	(red)			Main Battery = **Dead** (<6.5v) or CORTEX Off [2]
	(yellow)			Main Battery = **Low** (<6.5v) [2]
	(green)			Main Battery = Good
	Solid			All Good: Both Joysticks connected
	Solid + 1 Blink			All Good: Tx1 Joystick connected
	Fast			Autonomous only mode
	Fast (red) [3]			Fault: Low Backup Battery (0v-5v)
	Slow (red)			Fault: User Microprocessor Issue

Note 1: Robot LED only work when Linked
Note 2: Lowest CORTEX battery color latched at Joystick and CORTEX
Note 3: No Backup Battery only indicated if competition cable is connected.

Joystick [5]	Robot	VEXnet	**Game**	
			Off	No Competition connection
			Solid (green)	Driver [4]
			Fast (green)	Autonomous
			Fast (yellow)	Disabled

Note 4 : Game LED Driver indicator is only used when the competition cable is connected.

Joystick [5]	Robot	VEXnet	Game	
(red)				Joystick Battery = **Dead** (<6.5v)
(yellow)				Joystick Battery = **Low** (<6.5v)
(green)				Joystick Battery = Good
Fast				Two Joysticks in use
Solid				One Joystick in use

Note 5 : Joystick LED only on Joystick.

Update Utility Tool Indicators

Joystick [5]	**Robot**	**VEXnet**	**Game**	
		Solid (green)		Tether to PC
	Slow (green)		Flickering (green)	Bootload Mode - Ready to update firmware
	Slow (green)	Slow (red)	Flickering (green)	Downloading Master Code

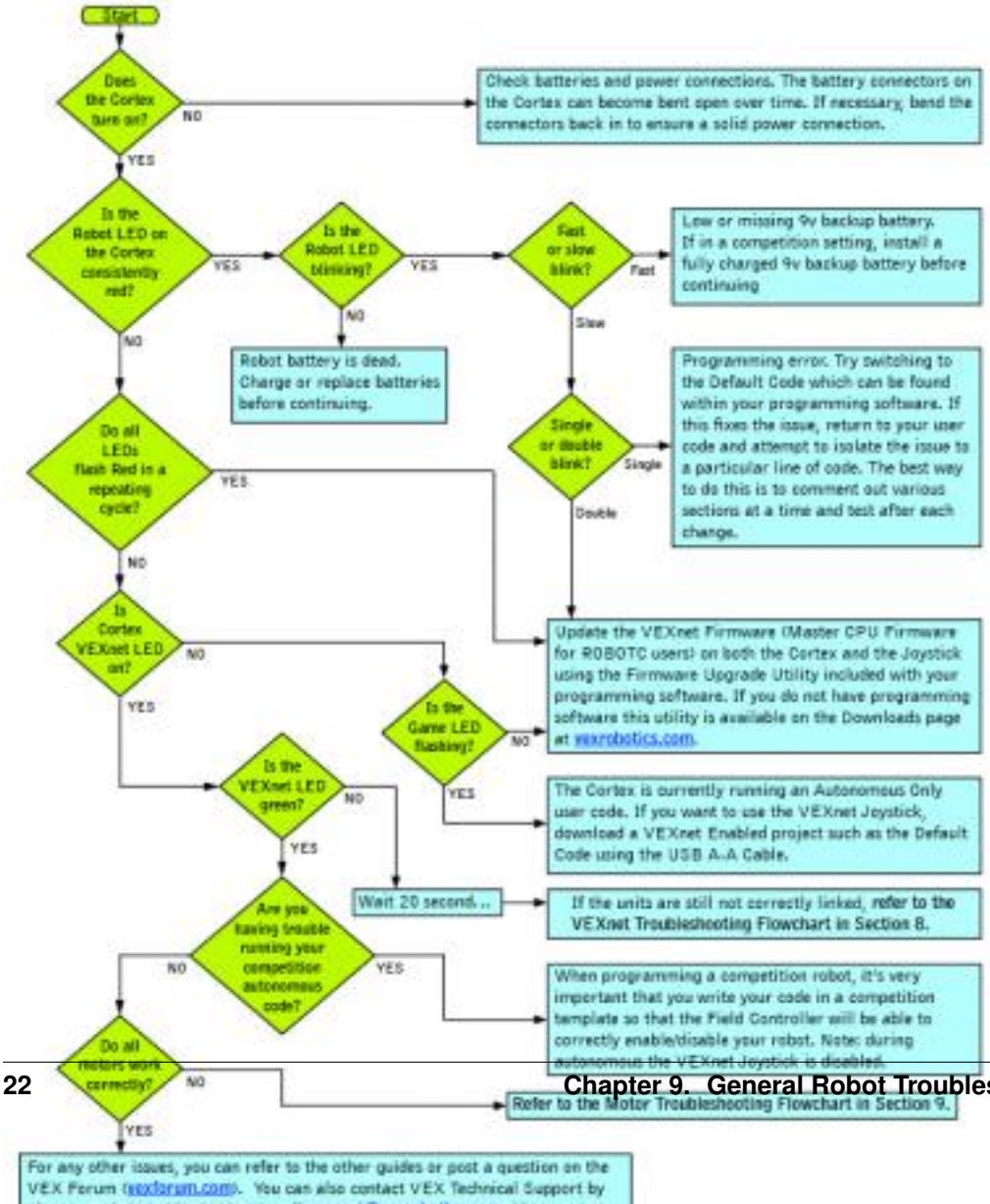
Other Indicators

Joystick [5]	**Robot**	**VEXnet**	**Game**	
(red)	(red)	(red)	(red)	Flash on all 3 indicates a Reset
		Slow (red) double blink		NO VEXnet Key detected
	Slow (red) double blink			Invalid ID in the CORTEX
Slow (red) double blink				Invalid ID in the Joystick


Robot, VEXnet, and Game LED's
show the same data [2]

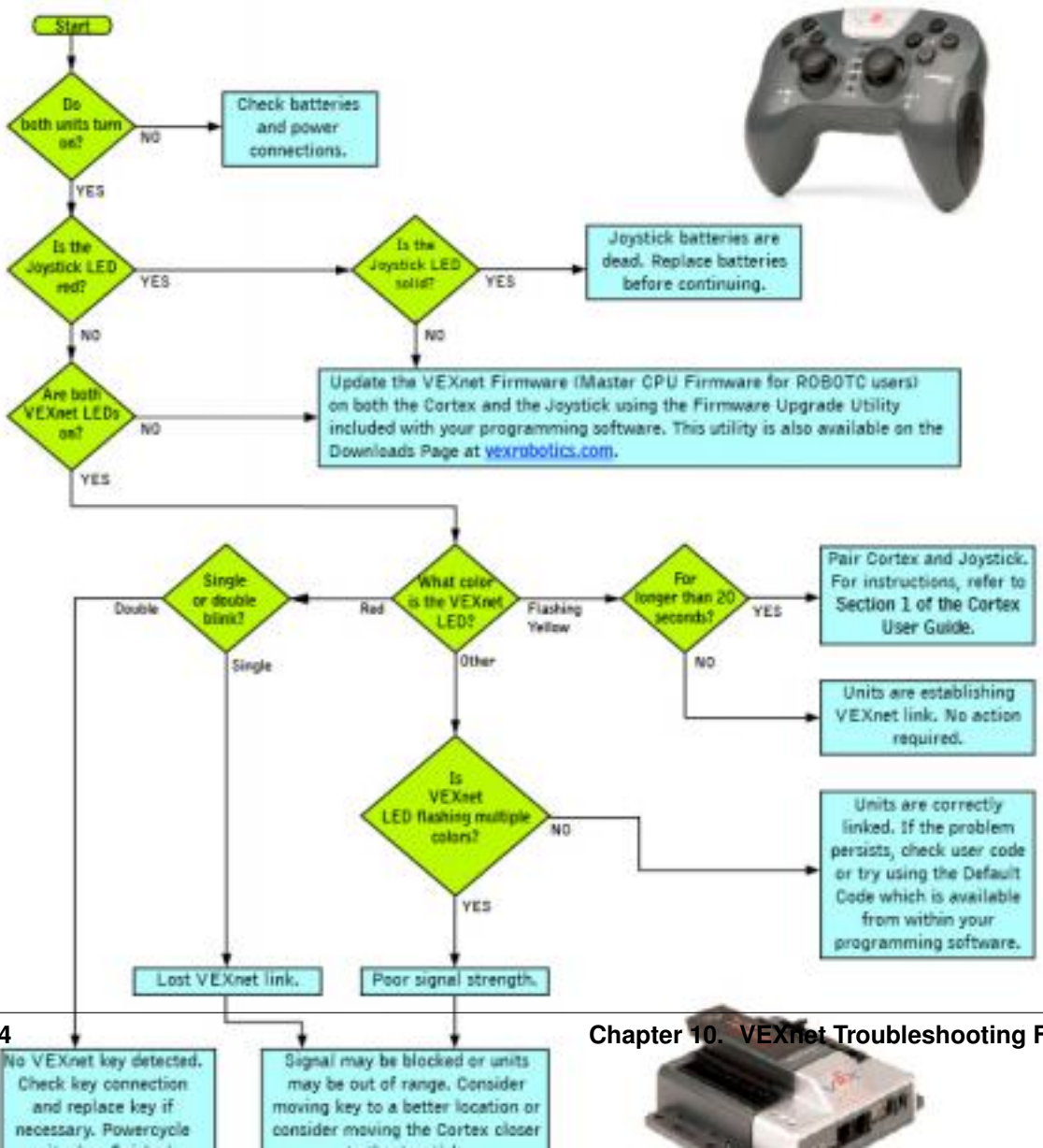
CHAPTER 9

General Robot Troubleshooting Flowchart



CHAPTER 10

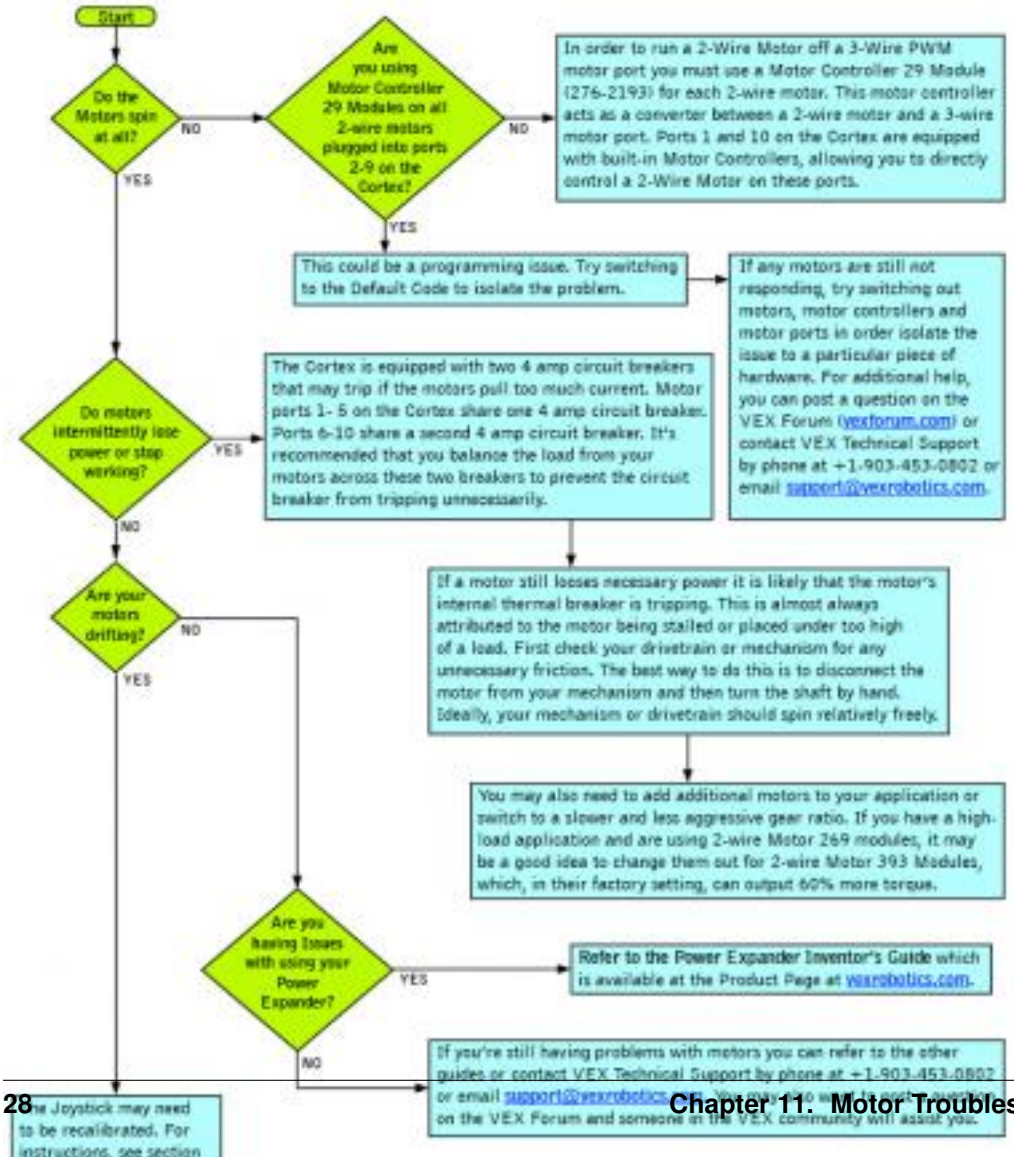
VEXnet Troubleshooting Flowchart



If the issue is still present after following this guide, update both the Cortex and Joystick with the most recent version of the VEXnet Firmware (Master CPU Firmware for ROBOTC users). If this does not resolve the problem, try using a different set of VEXnet keys. If you need further assistance you can post a question on the VEX Forum (https://vexforum.com) or contact VEX Technical Support by phone at +1-903-453-0802 or email support@vexrobotics.com.

CHAPTER 11

Motor Troubleshooting Flowchart



CHAPTER 12

Still Having Trouble?

If you're still having trouble,

Refer to VEXnet User's Guide for further help

CHAPTER 13

Bronky/main.py

main code

main.**BASE_DRIVE**()

Controls the base motors – Arcade drive
Calculates the power for the left and right drive

and runs the four base motors

main.**CLAW_DRIVE**()

Controls the claw motor

The fuctions acts as a togggle

When the claw is closed it applies continious power to the motor

main.**WRIST_DRIVE**()

Controls the wrist motors
Only when the buttons are pressed, the Motors receive power.

main.**autonomous**()

This is the autonomous period before the Teleop statsself.
Still in test phase –

main.**driver**()

This is the Teleop mode where the driver has the control over the robot.
The fucntion runs the claw, base and wrist in different threads

CHAPTER 14

Bronky/vex.py

Used by autodoc_mock_imports.

class vex.**Motor**(*self*, *Port#*)
Takes the port number of the Motor as Parameter.

off()
Turn off.

run(*self*, *power*)
Run at given power.

Parameter: -100.0...100.0 (percent power).

run_raw(*self*, *power_raw*)
Run at given raw power.

Parameters: -127.0...127.0 (raw power).

class vex.**Joystick**
Config VexNet joystick

is_partner(*self*) → bool
True if this is a partner joystick, false if it is main joystick.

set_deadband(*self*, *value*)
Set the deadband value for all axes (threshold below which axes would read out zero)

Parameters: value deadband threshold

axis1(*self*) → Returns number [-100...100]
Position on axis 1: -100.0 to 100.0.

axis2(*self*) → Returns number [-100...100]
Position on axis 2: -100.0 to 100.0.

axis3(*self*) → Returns number [-100...100]
Position on axis 3: -100.0 to 100.0.

axis4 (*self*) → Returns number [-100...100]
Position on axis 4: -100.0 to 100.0.

accelX (*self*) → bool
Accelerometer axis X: -100.0 to 100.0.

accelY (*self*) → bool
Accelerometer axis Y: -100.0 to 100.0.

b5up (*self*) → bool
Button 5 pressed UP: True/False.

b5down (*self*) → bool
Button 5 pressed DOWN: True/False.

b6up (*self*) → bool
Button 6 pressed UP: True/False.

b6down (*self*) → bool
Button 6 pressed DOWN: True/False.

b7up (*self*) → bool
Button 7 pressed UP: True/False.

b7down (*self*) → bool
Button 7 pressed DOWN: True/False.

b7left (*self*) → bool
Button 7 pressed LEFT: True/False.

b7right (*self*) → bool
Button 7 pressed RIGHT: True/False.

b8up (*self*) → bool
Button 8 pressed UP: True/False.

b8down (*self*) → bool
Button 8 pressed DOWN: True/False.

b8left (*self*) → bool
Button 8 pressed LEFT: True/False.

b8right (*self*) → bool
Button 8 pressed RIGHT: True/False.

vex.**battery_voltage**() → number
Get main battery voltage, in volts.

vex.**battery_backup_voltage**() → number
Get backup battery voltage, in volts.

vex.**debug_output** (*debug_output_type*)
Set debug output type.

debug_output_type: DebugOutput.AUTO|SERIAL|LCD|DISABLED

vex.**run_driver** (*function*)
Run the given function in a separate thread in DRIVER ONLY competition mode.

vex.**run_autonomous** (*function*)
Run the given function in a separate thread in AUTONOMOUS ONLY competition mode.

vex.**competition_switch**() -> *enum value (number*)
Returns state of the competition switch, as one of the constants in CompetitionSwitchState.

CHAPTER 15

Indices and tables

- genindex
- modindex

Python Module Index

m

v

Index