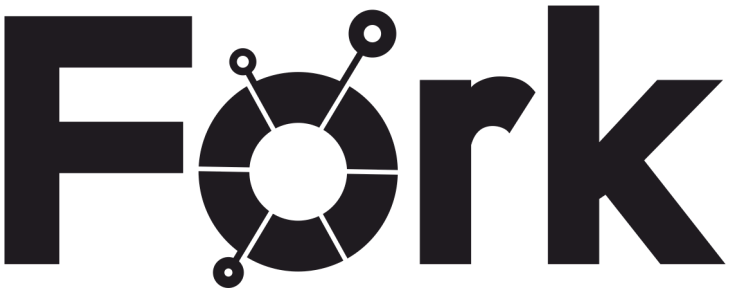


User's Guide

Revised December 12, 2020

Table of Contents

Product Summary

What's in Box?

Fork

Quick Start Guide

USB Type-C cable 1.5m

female-female 20cm 10wires cable

What Fork has onboard?

8 Digital Inputs (DI)

8 Digital Outputs (DO)

2 Analog Outputs (AO)

USB Type-C for power and Virtual COM port

Ethernet

Hardware version 2.1

8 Analog Inputs (AI)

1 Analog Input for low voltage (AI_LOW)

7 Digital Interface Lines (UART, SPI, I2C)

Hardware version 3.0

7 Analog Inputs (AI)

1 Analog Input for differential voltage (AI_DIFF)

8 Digital Interface Lines (UART, SPI, I2C)

Safety Summary & Warranty

Before using Fork for the first time, please carefully read the safety guidelines to avoid any injury or damage.

Electrical Isolation

The input and output channels on Fork are not electrically isolated from power supply.

Absolute Maximum Rating

Supply voltage	4.2V to 6V
Power Consumption	up to 5W
Digital Input Lines	-0.1 to +32V
Analog Input Lines	-32V to +32V
AI_LOW Input	-3V to +4V
Digital Output Externally Applied Voltage	-0.1V to +32V
DO Continious Source Current	20mA for all DO, internally limited
DO Continious Sink Current	200mA
Analog Output Externally Applied Voltage	-0.1V to +32V
Analog Output Continious Source Current	50mA, internally limited

Recommended Operating Conditions

Supply voltage	+4.2V to +6V
Power Consumption	*1W
Digital Input Lines	0V to +30V
Analog Input Lines	-10V to +10V
AI_LOW Input HW ver.2.1	-1V to +1V
Analog differential input Common-Mode Voltage Range HW ver.3.0	-30V to +30V
Analog differential input HW ver.3.0	-1.5V to +1.5V
Digital Output Externally Applied Voltage	0V to +30V
DO Source Current	5mA
DO Sink Current	100mA
Analog Output Voltage	0V to +10V
Analog Output Source Current	5mA

* Depends on connected load

Hardware

Connecting to PC

1. Connect Fork to USB wall charger using USB Type C cable
2. Once connected to power, Fork status led will turn Green
3. Connect Fork to PC via Ethernet cable

Connectors pinout HW ver 2.1

AI								AO	
0	1	2	3	4	5	6	7	0	1
AI0 LOW	GND	GND	GND	GND	GND	GND	GND	GND	GND

	DI								
GND	0	1	2	3	4	5	6	7	GND
GND	0	1	2	3	4	5	6	7	GND
	DO								

INTERFACE			
RX4	RX3	RX2	RX1
GND	TX3	TX2	TX1
UART			

INTERFACE			
MOSI			MISO
GND			SCK
SPI			

INTERFACE			
GND	SCL	SDA	
I2C			

Connectors pinout HW ver 3.0

AI								AO	
D+	0	1	2	3	4	5	6	AO0	AO1
D-	GND	GND	GND	GND	GND	GND	GND	GND	GND

	DI								
GND	0	1	2	3	4	5	6	7	GND
GND	0	1	2	3	4	5	6	7	GND
	DO								

INTERFACE				
RX1	RX2	RX3	RX4	VDD
TX1	TX2	TX3	TX4	GND
UART				

INTERFACE				
MOSI			MISO	VDD
			SCK	GND
SPI				

INTERFACE				
				VDD
	SCL	SDA		GND
I2C				

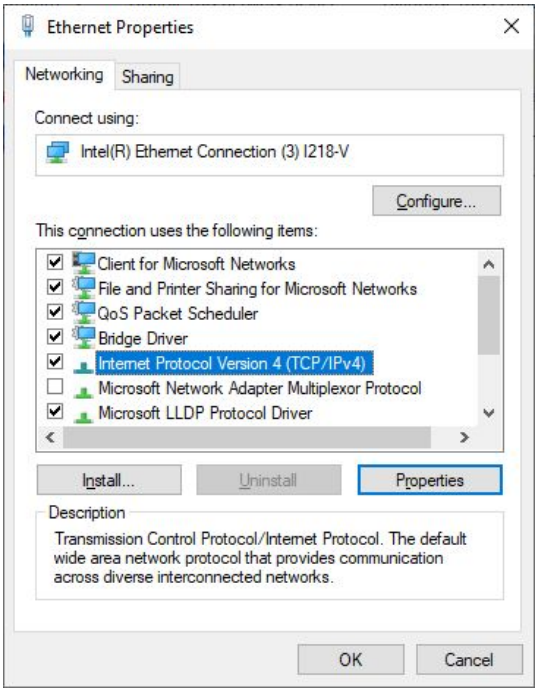
Software

Software downloading or installing is not need, as device is working through standard internet browser like Firefox or Chrome.

Note that Windows Internet Explorer is not supported

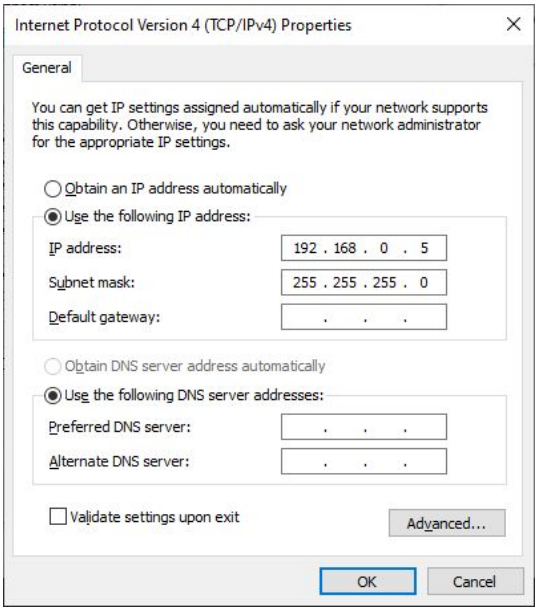
Connecting on Windows

1. Open Ethernet adapter settings and select “Internet Protocol Version 4” for edit



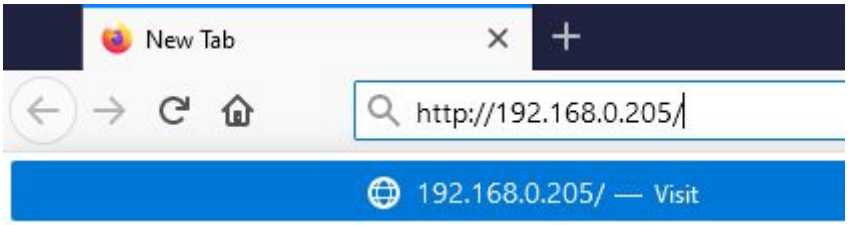
2. Press “Properties”

3. Edit Settings like on picture below and press “OK”



4. Open internet browser

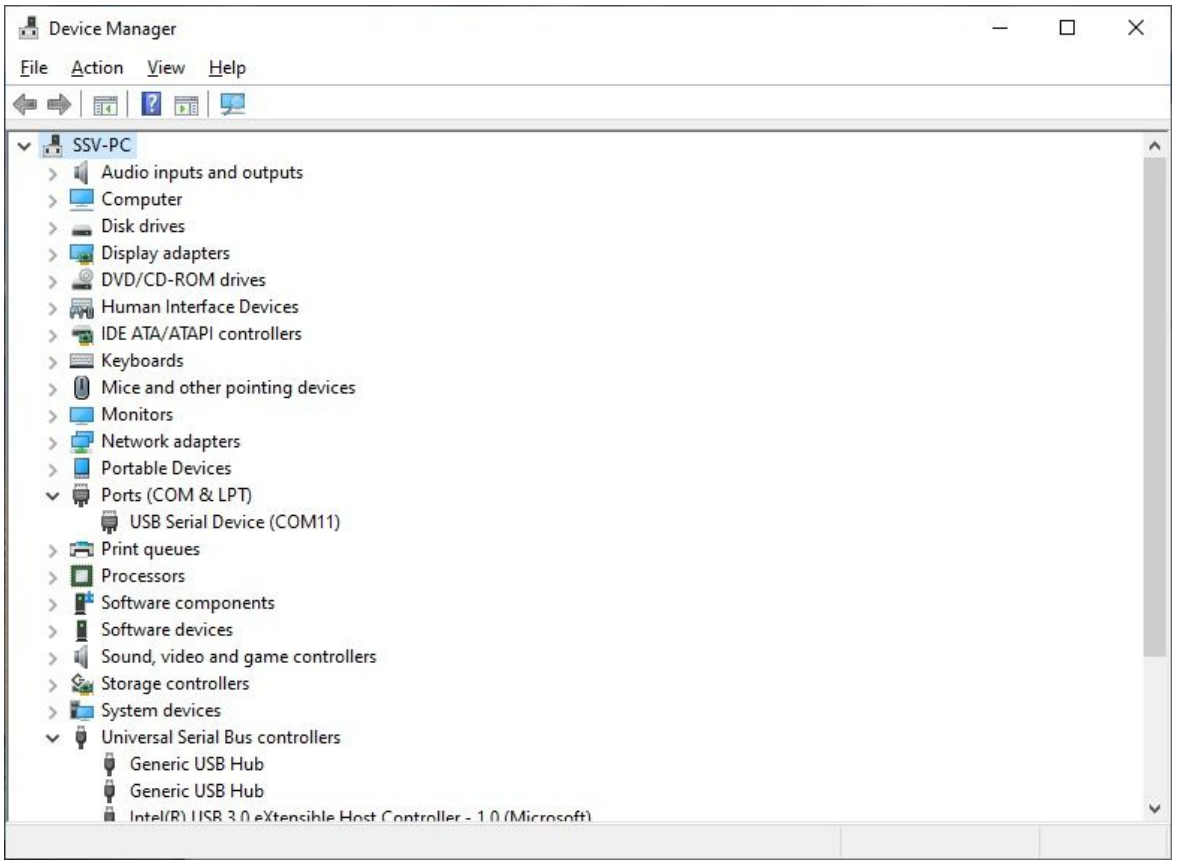
5. In Search line input “http://192.168.0.205/” and press “Enter”



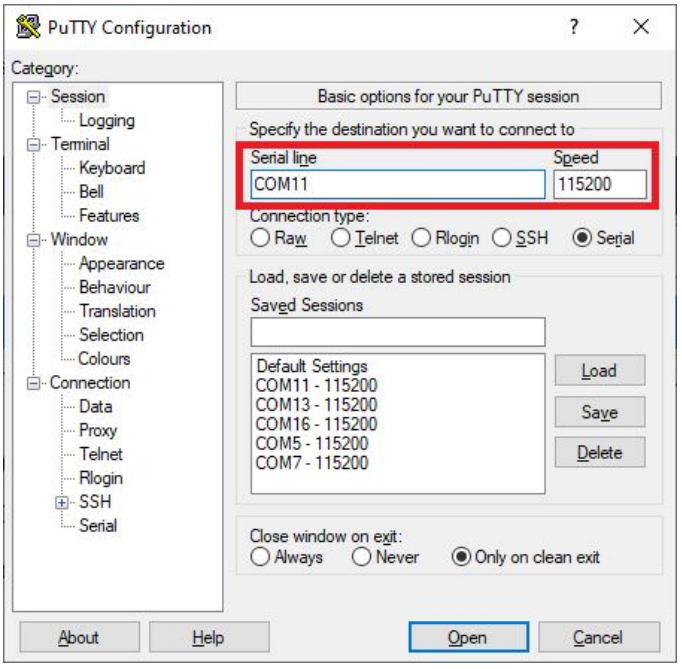
6. From now on you are connected to Fork and able to control all its inputs and outputs

Connecting by USB

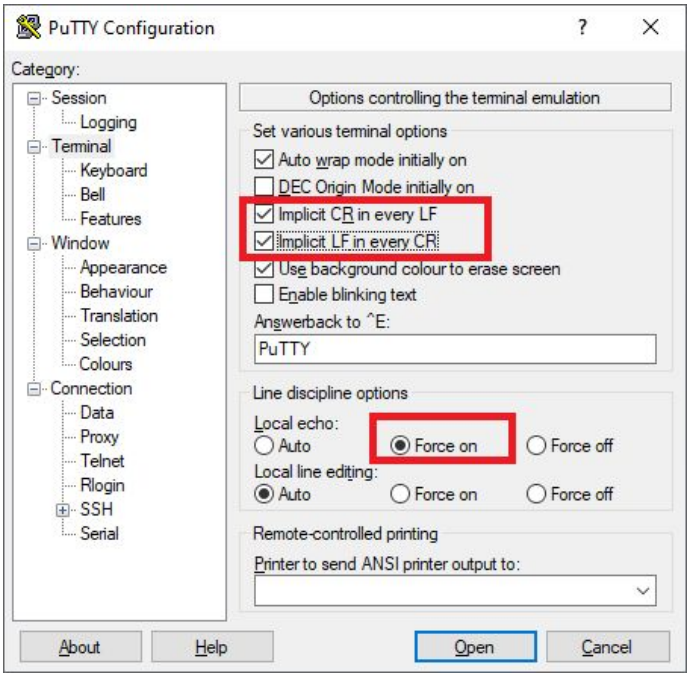
1. Find device in Device Manager in list of COM Ports.



2. Open any program for serial port. For example use PuTTY
3. Set COM Port of Fork and speed 115200

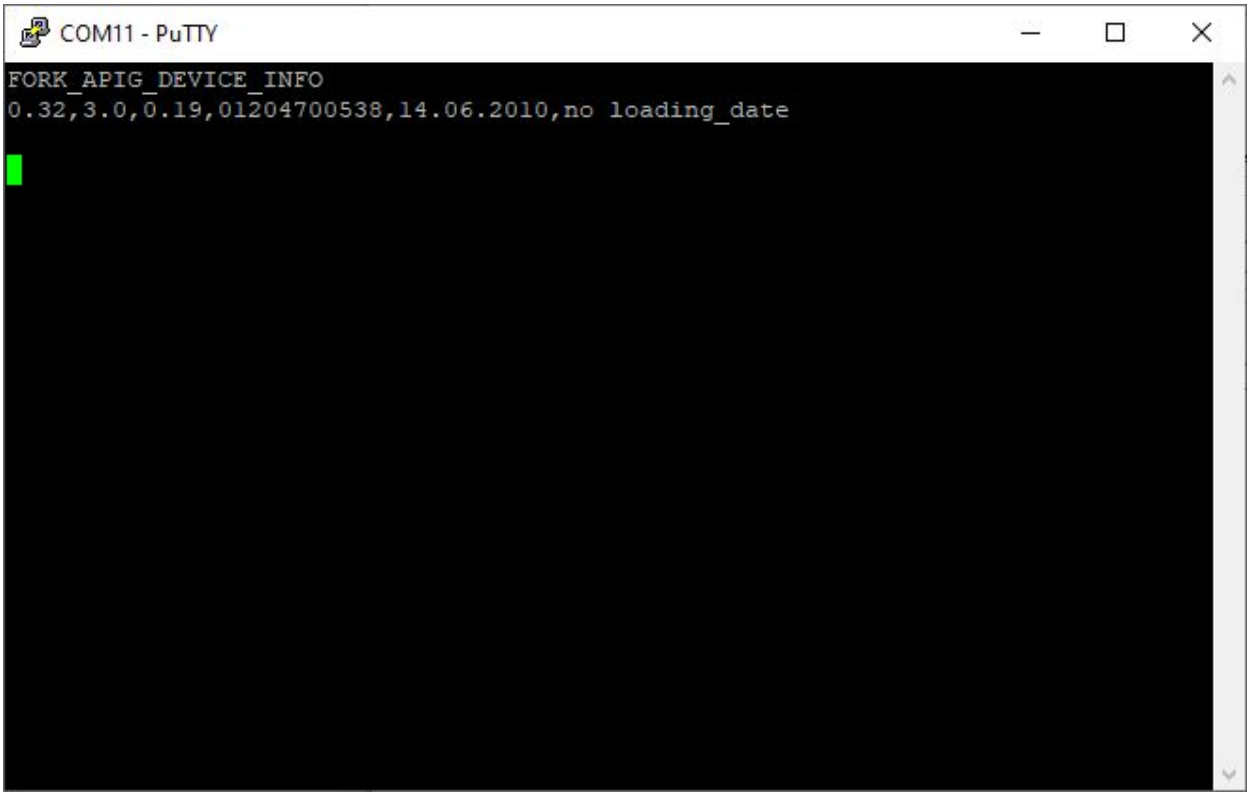


4. Click on the tab “Terminal” and set settings like on picture



5. Press Open
6. In opened Terminal Window write string

   FORK_API*cmd*
   and press enter



Controlling periphery

Periphery control is made through browser GET requests

For example, if you connect a wire from AO1 to AI1 and a wire from DO1 to DI1 you will be able to monitor DO1 state through measured DI1 state and AO1 voltage through measured AI1 voltage

Try it with Quick Start Guide from Fork site.

Changing IP address

By default Fork has Static 192.168.0.205 IP address

If You wish to change Fork IP address, input this API commands:

1. "/control?ETH_IP=192.168.0.223" – Fork new IP address will be 192.168.0.223

2. "/control?ETH_SAVE" – this command saves new IP to flash memory

3. Reset Fork by disconnecting fork from power for 2-3seconds

If you've forgotten the Fork IP address or somehow it was incorrect you can always restore Fork factory settings.

Restoring factory settings

Press and hold Reset button until Led blink (about 5 seconds)

Now all Fork settings including IP settings are factory restored.

Updating firmware

Fork firmware is updated through internal bootloader using browser.

Important! All wires to peripheral pins should be disconnected.

1. To enter bootloader you can:

   Hold reset button while plugging in USB Type-C power connector

   or

   input “http://192.168.0.205/start_bootloader” in browser

   Status led will turn blue

2. Download latest firmware from Fork site “http://forkfiles.com/forusers/fork_fw.bin”

3. Input “http://192.168.0.205/” in browser

   Press “Browse...” and select downloaded firmware

   Then press “Update firmware”

   In about 5-10seconds you’ll see a “success” message and Fork will automatically exit bootloader mode.