title : Electronic diagram `TWT jetting grid`
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url : https://github.com/Dennis-van-Gils/project-TWT-jetting-grid
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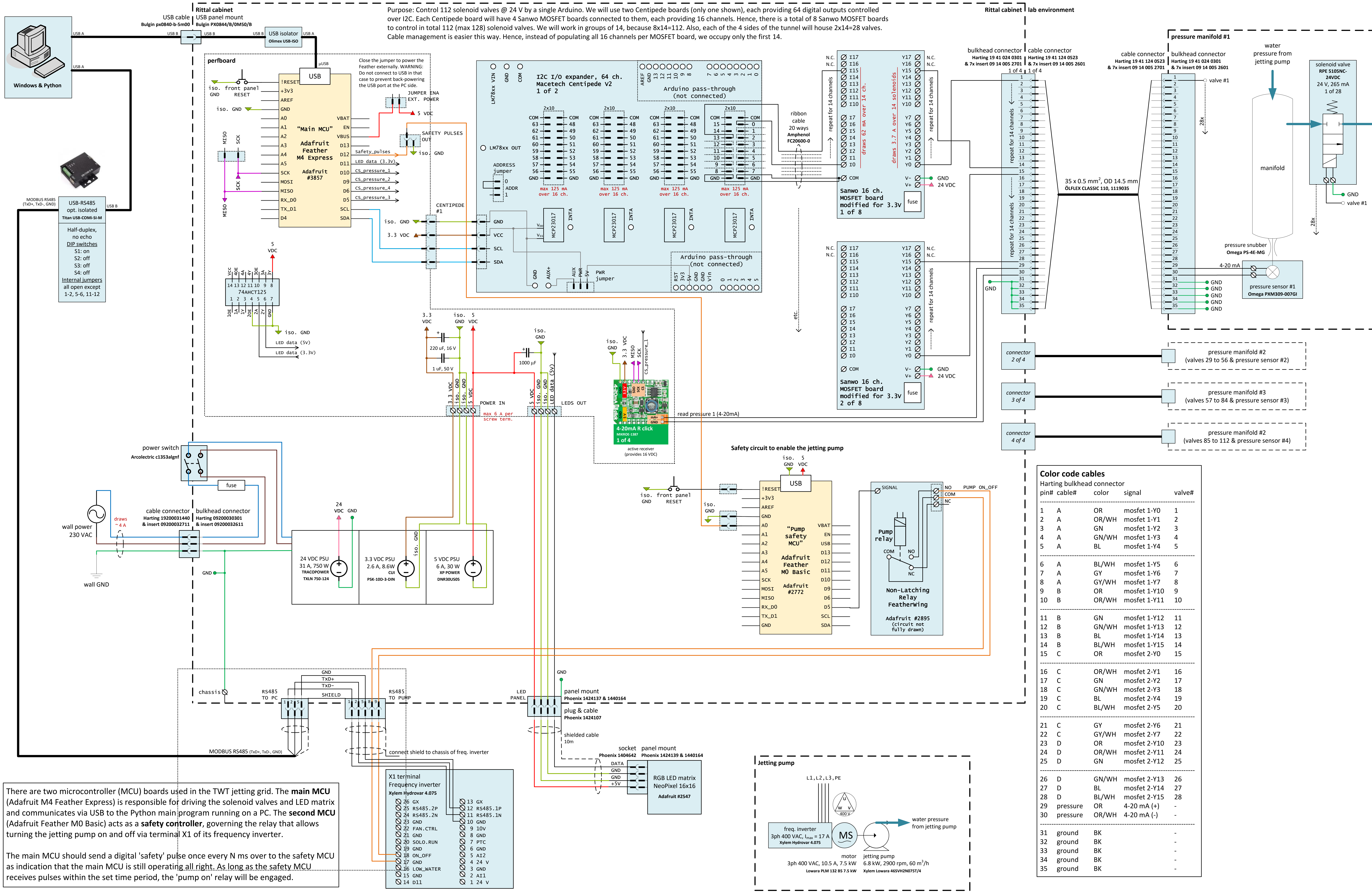
Purpose: Control 112 solenoid valves @ 24 V by a single Arduino. We will use two Centipede boards (only one shown), each providing 64 digital outputs controlled over I2C. Each Centipede board will have 4 Sanwo MOSFET boards connected to them, each providing 16 channels. Hence, there is a total of 8 Sanwo MOSFET boards to control in total 112 (max 128) solenoid valves. We will work in groups of 14, because 8x14=112. Also, each of the 4 sides of the tunnel will house 2x14=28 valves. Cable management is easier this way. Hence, instead of populating all 16 channels per MOSFET board, we occupy only the first 14.



There are two microcontroller (MCU) boards used in the TWT jetting grid. The **main MCU** (Adafruit M4 Feather Express) is responsible for driving the solenoid valves and LED matrix and communicates via USB to the Python main program running on a PC. The **second MCU** (Adafruit Feather M0 Basic) acts as a **safety controller**, governing the relay that allows turning the jetting pump on and off via terminal X1 of its frequency inverter.

The main MCU should send a digital 'safety' pulse once every N ms over to the safety MCU as indication that the main MCU is still operating all right. As long as the safety MCU receives pulses within the set time period, the 'pump on' relay will be engaged.

Color code cables

Harting bulkhead connector

pin#	cable#	color	signal	valve#
1	A	OR	mosfet 1-Y0	1
2	A	OR/WH	mosfet 1-Y1	2
3	A	GN	mosfet 1-Y2	3
4	A	GN/WH	mosfet 1-Y3	4
5	A	BL	mosfet 1-Y4	5
6	A	BL/WH	mosfet 1-Y5	6
7	A	GY	mosfet 1-Y6	7
8	A	GY/WH	mosfet 1-Y7	8
9	B	OR	mosfet 1-Y10	9
10	B	OR/WH	mosfet 1-Y11	10
11	B	GN	mosfet 1-Y12	11
12	B	GN/WH	mosfet 1-Y13	12
13	B	BL	mosfet 1-Y14	13
14	B	BL/WH	mosfet 1-Y15	14
15	C	OR	mosfet 2-Y0	15
16	C	OR/WH	mosfet 2-Y1	16
17	C	GN	mosfet 2-Y2	17
18	C	GN/WH	mosfet 2-Y3	18
19	C	BL	mosfet 2-Y4	19
20	C	BL/WH	mosfet 2-Y5	20
21	C	GY	mosfet 2-Y6	21
22	C	GY/WH	mosfet 2-Y7	22
23	D	OR	mosfet 2-Y10	23
24	D	OR/WH	mosfet 2-Y11	24
25	D	GN	mosfet 2-Y12	25
26	D	GN/WH	mosfet 2-Y13	26
27	D	BL	mosfet 2-Y14	27
28	D	BL/WH	mosfet 2-Y15	28
29	pressure	OR	4-20 mA (+)	-
30	pressure	OR/WH	4-20 mA (-)	-
31	ground	BK		-
32	ground	BK		-
33	ground	BK		-
34	ground	BK		-
35	ground	BK		-

title	: Circuit diagram `Sanwo 16 channel MOSFET board`
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