title : Electronic diagram `TWT jetting grid` author: Dennis van Gils : https://github.com/Dennis-van-Gils/project-TWT-jetting-grid date : 18-11-2022 Rittal cabinet 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 Rittal cabinet | lab environment USB cable USB panel mount
Bulgin px0840-b-5m00 Bulgin PX0844/B/0M50/B 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. USB B USB isolator USB A Cable management is easier this way. Hence, instead of populating all 16 channels per MOSFET board, we occupy only the first 14. pressure manifold #1 bulkhead connector cable connector pressure from cable connector bulkhead connector N.C. Ø I17 N.C. Ø I16 Harting 19 41 024 0301 | Harting 19 41 124 0523 perfboard Close the jumper to power the Harting 19 41 124 0523 Harting 19 41 024 0301 jetting pump Y16 Ø N.C. solenoid valve 0 0 0 00000000 00000000 Feather externally. WARNING: Ø 115 Y15 Ø 1 of 4 1 1 of 4 RPE 5105NC-Do not connect to USB in that V 9 5 4 8 7 H 0 Ø 110 Ø 111 Ø 113 Ø 113 Ø 115 Å C USB I2C I/O expander, 64 ch. Y14 Ø 24VDC case to prevent back-powering Macetech Centipede V2 Y13 Ø 24 V, 265 mA the USB port at the PC side. iso. front panel Arduino pass-through +3V3 Y12 Ø 1 of 28 RESET EXT. POWER (not connected) 711 Ø AREF Y10 Ø iso. GND Y7 Ø Y6 Ø 15 - 0 "Main MCU" Y5 Ø SAFETY PULSES Amphenol FC20600-0 Y4 Ø ŬŬ OU™ Adafruit Y3 Ø Y2 Ø O LM78xx OUT Feather D12 Safety\_pulses 🔟 👉 iso. GND M4 Express D11 LED data (3.3V) ADDRESS D10 CS\_pressure\_1 jumper Adafruit #3857 V- Ø GND D9 CS\_pressure\_2 0 ADDR 1 35 x 0.5 mm<sup>2</sup>, OD 14.5 mm V+ Ø ▲ 24 VDC D6 CS\_pressure\_4 ÖLFLEX CLASSIC 110, 1119035 Sanwo 16 ch. ● GND over 16 ch. D5 CS\_pressure\_3 MOSFET board MODBUS RS485 (TxD+, TxD-, GND) USB-RS485 ——○ valve #1 CENTIPEDE modified for 3.3V TX\_D1 opt. isolated 1 of 8 MCP23017 O INTA Titan USB-COMi-SI-N Half-duplex, 3.3 VDC (<del>=</del>⊢ vcc no echo **DIP** switches N.C. Ø 117 Ø 116 Ø 115 Ø 114 Ø 113 Ø 112 Ø 111 Ø 110 pressure snubber Y17 Ø N.C VDC Omega PS-4E-MG Y16 Ø N.C. Arduino pass-through S2: off 4-20 mA 🛇 Y15 0 \_(not connected) S3: off Y14 Ø YOW PWR jumper 14 13 12 11 10 9 8 S4: off Y13 Ø Internal jumpers Y12 Ø Y11 Ø ■ GND 000000 000000 pressure sensor #1 all open except GND GND 74AHCT125 1-2, 5-6, 11-12 Omega PXM309-007GI Y10 Ø GND 1 2 3 4 5 6 7 GND Ø 17 Ø 16 Ø 15 Ø 14 Ø 13 Ø 12 Ø 11 Ø 10 Y7 Ø Y6 Ø Y5 Ø Y4 Ø Y3 Ø Y2 Ø GND 3.3 iso. 5 GND VDC VDC LED data (5V) ,-----220 uF, 16 V Y1 Ø LED data (3.3V) pressure manifold #2 connecto 2 of 4 (valves 29 to 56 & pressure sensor #2)  $1000\ \mu\text{F}$ V- Ø GND V+ Ø △ 24 VDC 1 uF, 50 V Ø com \_\_\_\_\_\_ Sanwo 16 ch. MOSFET board pressure manifold #3 connecto *ØØØØ* modified for 3.3v 3 of 4 (valves 57 to 84 & pressure sensor #3) POWER IN LEDS OUT 2 of 8 read pressure 1 (4-20mA) 20mA R click pressure manifold #2 connector 4 of 4 (valves 85 to 112 & pressure sensor #4) Safety circuit to enable the jetting pump active receiver power switch (provides 16 VDC) Arcolectric c1353algnf Color code cables Harting bulkhead connector USB LØ SIGNAL fuse PUMP ON\_OF pin# cable# valve# iso. front panel +3V3 RESET AREF mosfet 1-Y0 cable connector bulkhead connector Harting 19200031440 Harting 09200030301 OR/WH mosfet 1-Y1 wall power GN mosfet 1-Y2 230 VAC safety GN/WH mosfet 1-Y3 MCU" mosfet 1-Y4 BLŎ-Adafruit 24 VDC PSU 5 VDC PSU 3.3 VDC PSU 31 A, 750 W TRACOPOWER + 2.6 A, 8.6W **+** 6 A, 30 W XP POWER mosfet 1-Y5 Feather MO Basic GND O-GΥ mosfet 1-Y6 PSK-10D-3-DIN DNR30US05 GY/WH mosfet 1-Y7 wall GND Adafruit MOSI Non-Latching OR mosfet 1-Y10 10 B OR/WH mosfet 1-Y11 10 FeatherWing RX\_D0 TX\_D1 mosfet 1-Y12 11 Adafruit #2895 GND (circuit not fully drawn) GN/WH mosfet 1-Y13 12 12 B mosfet 1-Y14 13 13 B BL/WH mosfet 1-Y15 14 14 B OR mosfet 2-Y0 15 15 C OR/WH mosfet 2-Y1 mosfet 2-Y2 17 17 C GN/WH mosfet 2-Y3 18 18 C panel mount chassis 🛇 PANEL Phoenix 1424137 & 1440164 mosfet 2-Y4 19 BL/WH mosfet 2-Y5 20 20 C plug & cable **| '| "| "| "| "|** Phoenix 1424107 mosfet 2-Y6 21 GY/WH mosfet 2-Y7 22 shielded cable 22 C mosfet 2-Y10 23 23 D socket panel mount connect shield to chassis of freq. inverter MODBUS RS485 (TxD+, TxD-, GND) OR/WH mosfet 2-Y11 24 24 D Phoenix 1404642 Phoenix 1424139 & 1440164 DATA
GND
GND
+5V mosfet 2-Y12 25 25 D Jetting pump X1 terminal RGB LED matrix L1,L2,L3,PE GN/WH mosfet 2-Y13 26 Frequency inverter NeoPixel 16x16 mosfet 2-Y14 27 27 D Xylem Hydrovar 4.075 Adafruit #2547 BL/WH mosfet 2-Y15 28 \( \) 13 GX \( \) 12 RS485.1P \( \) 11 RS485.1N \( \) 10 GND \( \) 9 10V **◯** 26 GX 29 pressure OR 4-20 mA (+) **◯** 25 RS485.2P 30 pressure OR/WH 4-20 mA (-) Q 24 RS485.2N water pressure 23 GND 22 FAN.CTRL from jetting pump freq. inverter 31 ground MS ) Q 21 GND Ø 8 GND 3ph 400 VAC, I<sub>max</sub> = 17 A 32 ground 20 SOLO.RUN Xylem Hydrovar 4.075 Ø 6 GND Ø 5 AI2 **№** 19 GND 33 ground \_\_\_\_\_\_\_\_\_18 ON\_OFF motor jetting pump 34 ground BK 17 GND 16 LOW\_WATER Q 4 24 V 3ph 400 VAC, 10.5 A, 7.5 kW 6.8 kW, 2900 rpm, 60 m<sup>3</sup>/h ∑ 3 GND 35 ground BK Lowara PLM 132 B5 7.5 kW Xylem Lowara 46SVH2N075T/4 Q 2 AI1

🛇 1 24 V

**№** 14 D11

title : Circuit diagram `Sanwo 16 channel MOSFET board`

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